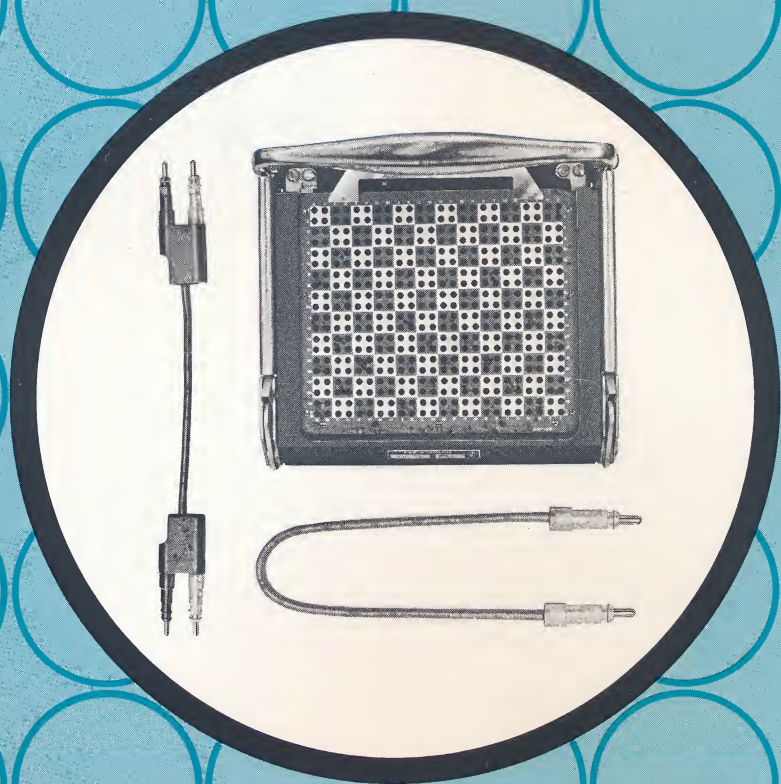
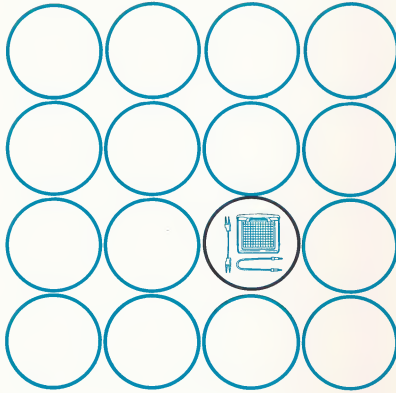


# ***Universal Patchcord Programming Products by AMP***





# INTRODUCTION



A-MP★ SYSCOM★ Universal Patchcord Programming Systems and Panels provide almost infinite switching combinations through the use of permanently wired rear boards and variously programmed front boards. They are designed to meet the most critical demands of advanced electronic applications. They feature a number of exclusive developments and meet the highest standards of quality and construction. Here is a brief summary of the more noteworthy advantages of these programming systems and panels:

- **Double wiping action.** This patented AMP development provides for over-center camming action of the patchcord pin. This action wipes the chevron-shaped spring contact up to a point of maximum travel, then recedes, with a reverse wiping action, to leave the contact clean of contaminants.
- **Gold over nickel plating.** Our gold plating quality exceeds the requirements of MIL-G-45204. This exclusive process combines non-porosity characteristics with close control of plating thicknesses. Applied over a sub-plating of nickel, it forms an effective oxide-migration barrier to provide excellent conductivity.
- **Simplicity of design.** Reliability is enhanced with the use of a minimum number of parts. This applies to overall construction of the systems and panels and to both the manual and semi-permanent types of patchcord pins.
- **Choice of rear-bay wiring.** This choice involves LANCELOK★ Terminals and spring receptacles which provide a high-conductivity, multiple-contact area and positive retention; and A-MP Taper Pins with excellent electrical characteristics and minimum retention of nine pounds per contact. Both types simplify rear-bay wiring changes.
- **Most complete line.** This includes panel mount, rack mount, fixed panels, and anti-vibration systems to permit a full programming range for every type of programming application calling for Universal Patchcord Programming Systems.
- **Easiest post-patching.** New, simplified design elements permit rapid post-patching of front boards while equipment remains in operating position.

All A-MP Patchcord Programming Devices are engineered and built to exceed standards called for in military specifications and to meet or exceed the most stringent commercial requirements.

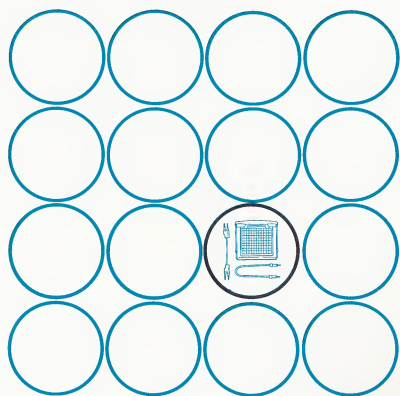
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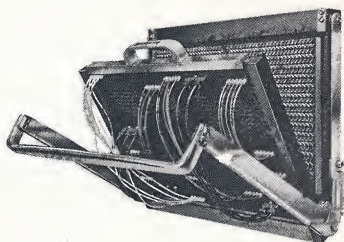


# **A-MP**

## **Universal**

### **Programming**

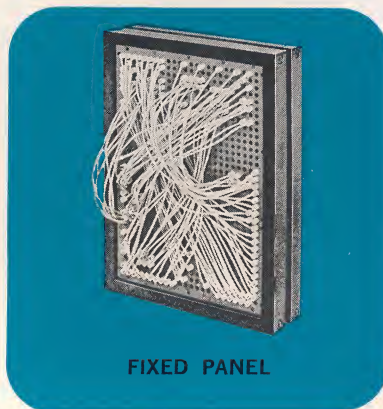
### **Products**



**PANEL MOUNT SYSTEM**



**RACK MOUNT SYSTEMS**



**FIXED PANEL**

#### **A-MP PROGRAMMING DEVICES**

These programming products are divided into two classifications: systems and panels. These are designed to meet the increasing need for complex and varied switching combinations.

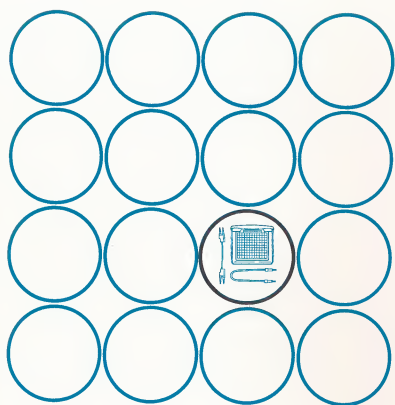
Programming **systems** are made up of a metal frame assembly which encases a permanent rear board. This board contains contact springs which connect to the internal wiring of the electronic equipment in use. Its function is to accept interchangeable patchboards that are programmed with patchcords to create whatever circuit may be required for a given switching operation. Many types of patchcords, from a single conductor to shunts, squids and multiple shielded types are available for this purpose in lengths from 3" to 35".

Programming **panels** consist of a metal frame assembly containing a fixed rear board and a non-removable programming patchboard. Other elements used in this application—contact springs and patchcords are identical to those used in the patchboard systems.

As an indication of the flexibility of A-MP programming products, a model P1632 system can function as any one of the following:

- 1 pole 1631 throw switch
- 816 pole single throw switch
- 544 pole double throw switch
- 408 pole triple throw switch

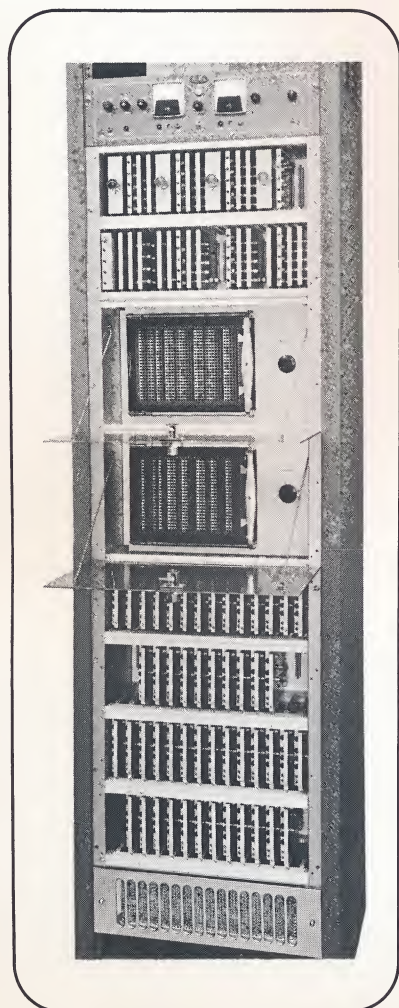
Moreover, this same system can provide combinations of the above pole and throw arrangement.



## ***Specific Applications***

The capabilities of A-MP Universal Patchcord Programming Products are seemingly endless. All such products are designed to help solve varied and complex programming problems.

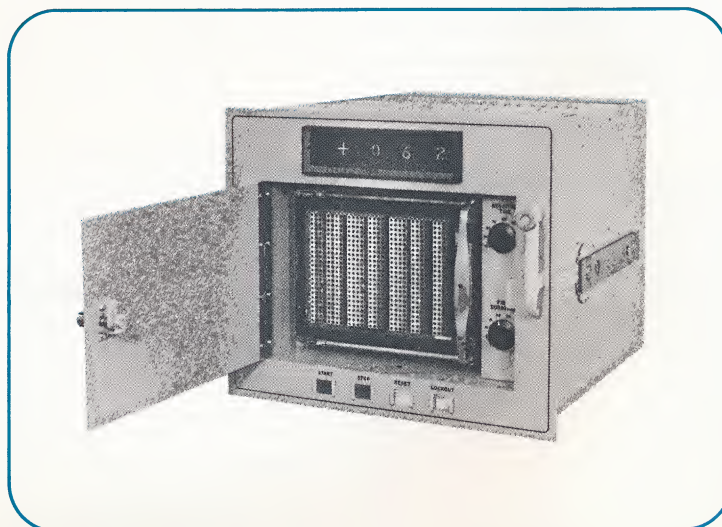
The applications briefly described on this and the following page typify the range and versatility of Patchcord programming methods.



### **NAVIGATION COMPUTER CORPORATION — Norristown, Pa.**

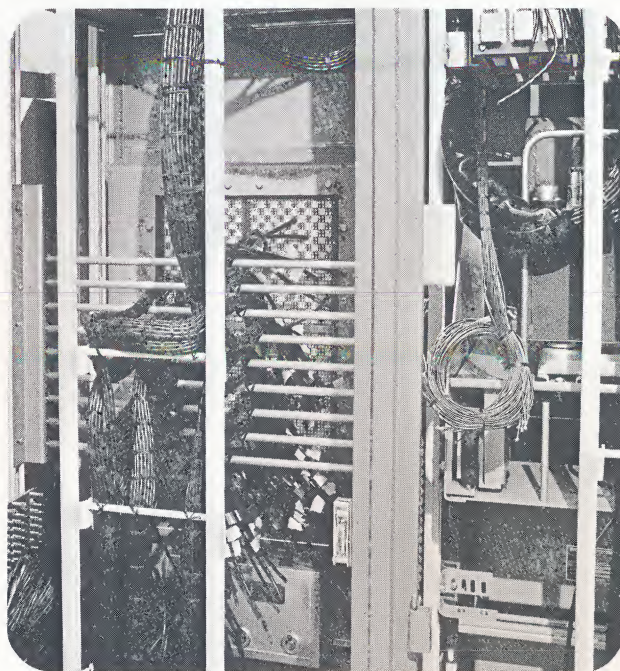
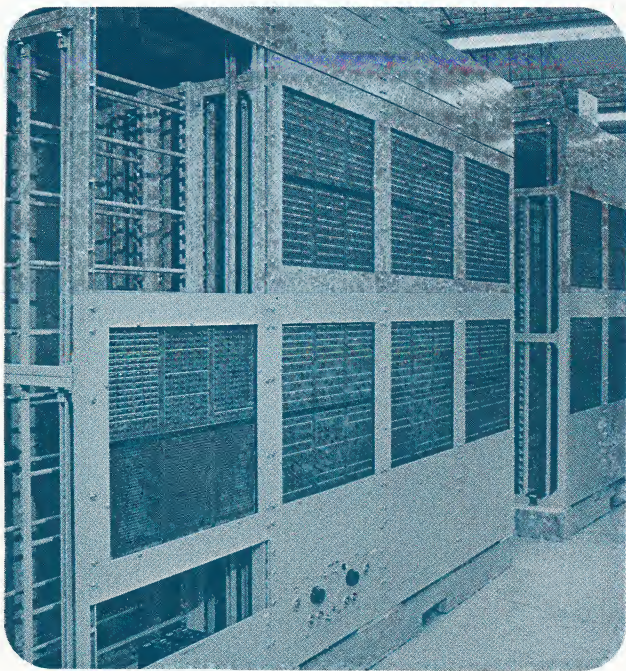
The A-MP Patchcord System is used here as a missile programmer with 24 discrete relay closures. Programming fixes duration of firing pulse and countdown period before "fire".

This NAVCOR missile programmer provides 24 relay closures in 500 seconds. Each of the 24 DPDT relays can be programmed on a removable patchboard to close at any even tenth second from 0.2 to 499.8 seconds after programming starts.



Photographs courtesy of NAVIGATION COMPUTER CORPORATION





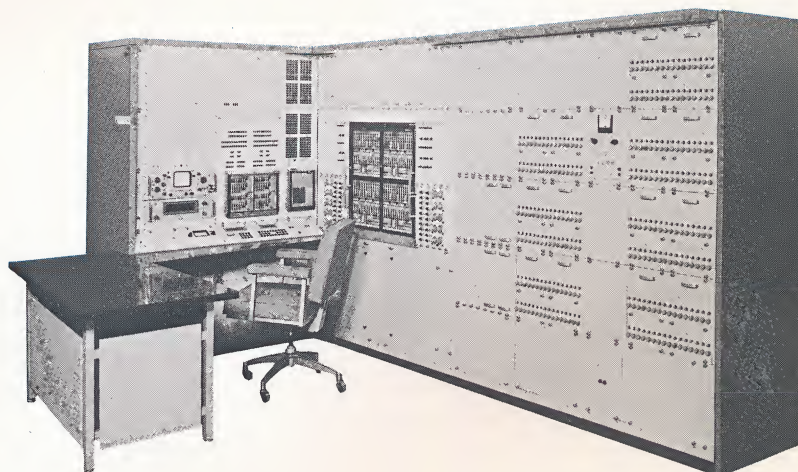
Photographs courtesy of LEAR SIEGLER, INC.

**LEAR SIEGLER, INC./Electronic Instrumentation Division  
Anaheim, Calif.**

The A-MP Programming Fixed Panels shown here are a part of the ground support equipment installation at one of NASA's Saturn S-5 test sites. These programming panels are installed in 289 cabinets, all are used to check out the first stage vehicle of the Saturn S-5 program.

**APPLIED DYNAMICS, INC.  
Ann Arbor, Mich.**

Three A-MP Patchcord Programming Systems are used in this company's AD-256 General Purpose Analog Computer. This computer is completely controlled by logic level signals resulting in a highly flexible system for Hybrid applications. Aside from a number of other important control areas, this system makes it possible to accurately solve large nonlinear, iterative optimization type problems formerly beyond the capability of standard general purpose analog computers.

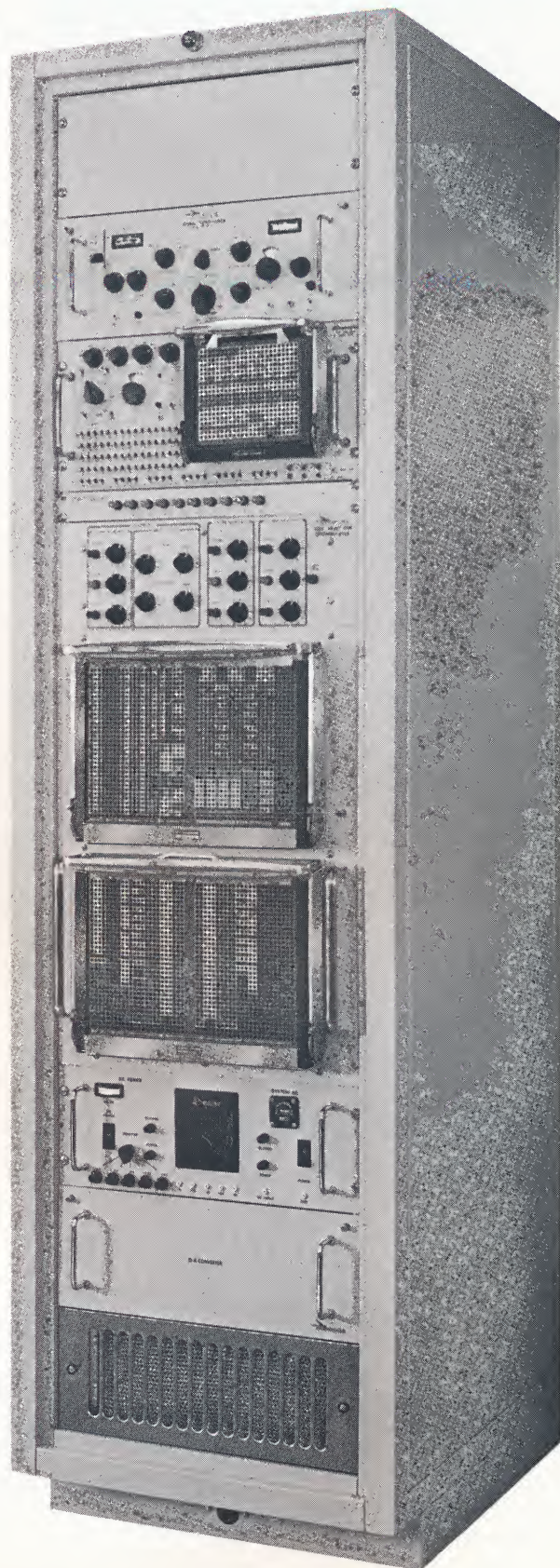
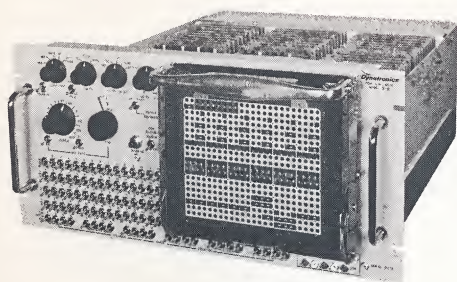


Photograph courtesy of APPLIED DYNAMICS, INC.



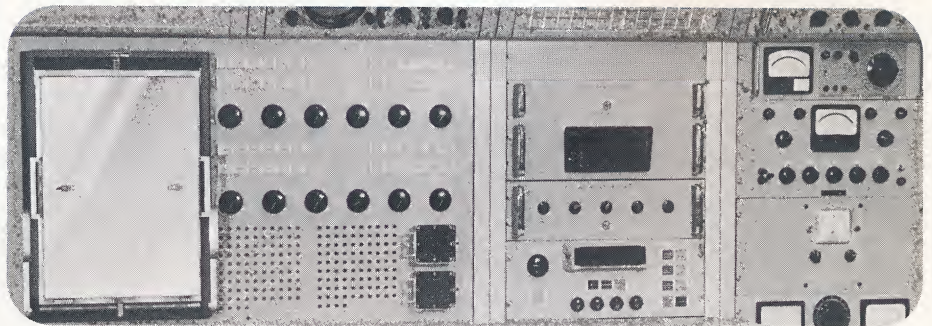
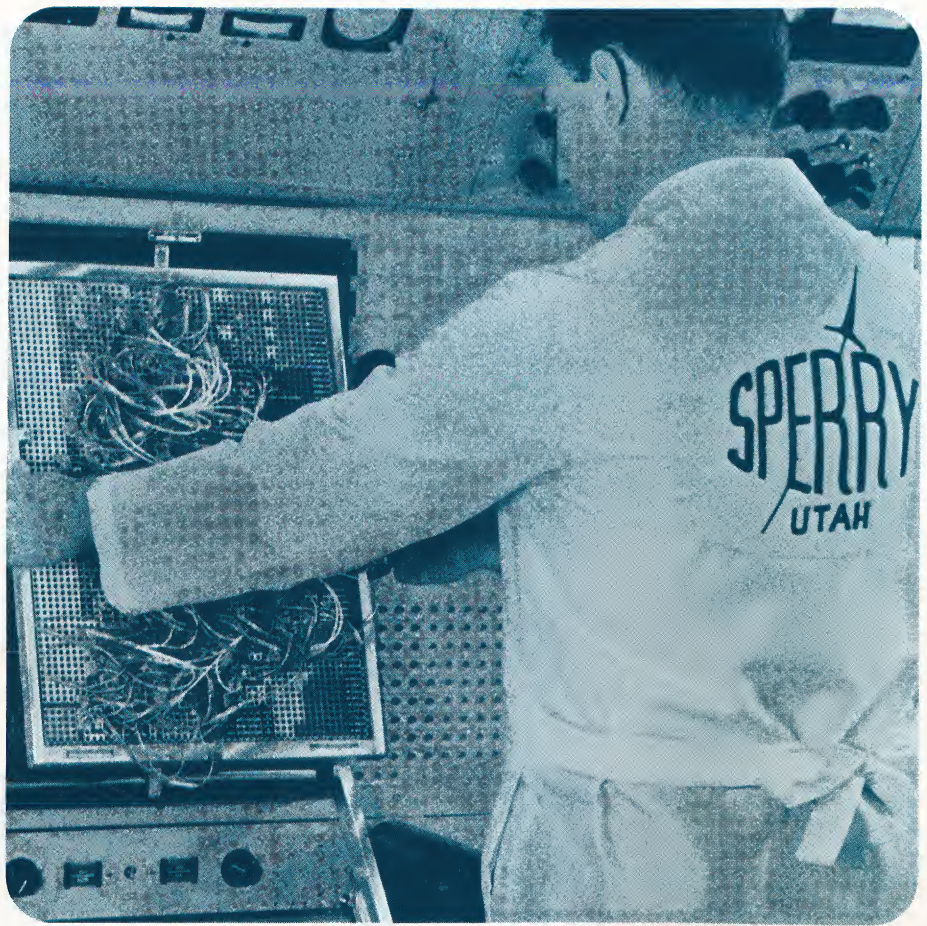
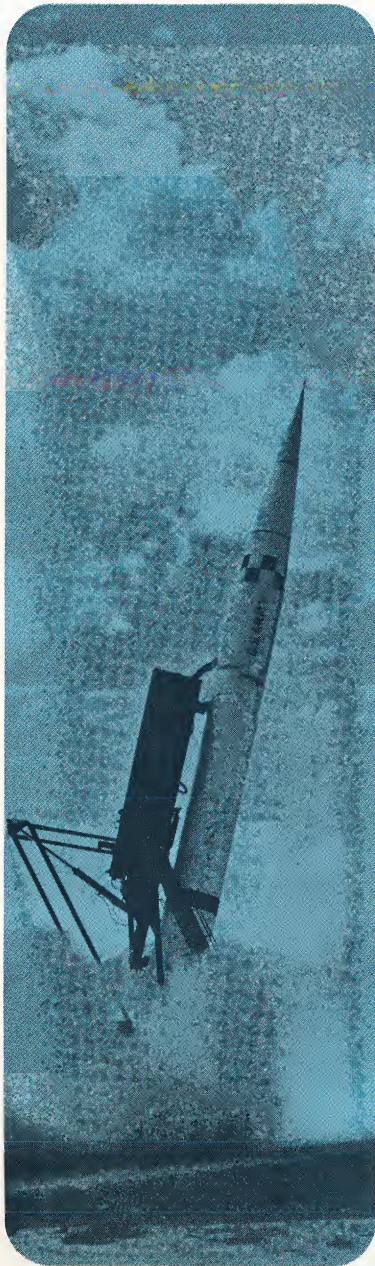
**DYNATRONICS, INC.**  
**Orlando, Fla.**

This company uses A-MP Patch-board Programming Systems in its one-rack PCM ground station to provide the flexibility required for processing DynaSoar, Minuteman, Saturn, and Titan data formats. The system receives demodulated serial PCM data, regenerates it into a noise-free serial pulse train, decommutates the format, and converts selected data channels to analog form.



Photographs courtesy of DYNATRONICS, INC.



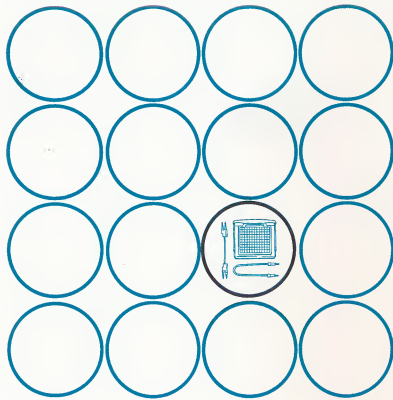


Photographs courtesy of SPERRY UTAH

#### **SPERRY UTAH — Salt Lake City, Utah**

Here we find uses for A-MP Patchcord Programming Systems in more than 60 individual test programs in the manufacture of the Sergeant, the Army's supersonic ballistic missile. These systems make possible production line, fourth echelon, or other high-speed sub-assembly level testing.



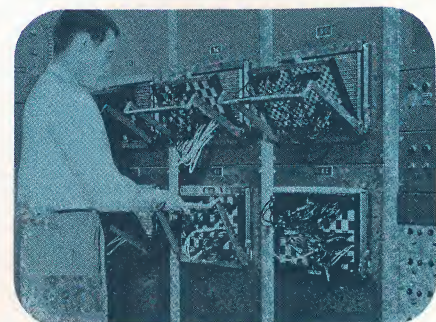


# ***Types of Universal Patchcord Programming Systems & Panels***

There are five types of A-MP Universal Patchboard Programming Products: (1) **Panel Mount Systems** (2) **Rack Mount Systems** (3) **Anti-Vibration Systems** (4) **Airborne Systems** (5) **Fixed Panels**. These systems and panels are available in a variety of sizes for such applications as data processing equipment, digital computers, automatic test equipment, electronic switching, automation processes, statistical analysis, decision theory, medical computation and many more.

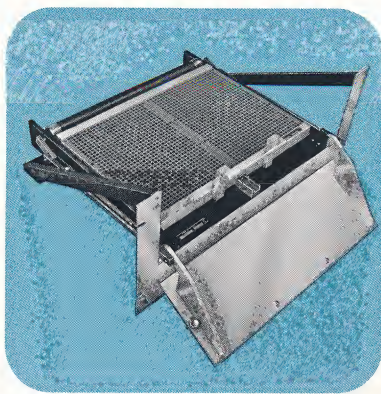
## **PANEL MOUNT SYSTEMS**

These vertically mounted systems consist of a metal frame assembly containing a permanent, fully wired rear board with contact springs which, in turn, are connected to the internal wiring of a wide variety of electronic equipment. Matching removable front patchboards are pre-programmed with manual type or semi-permanent type patchcords with metal tips that mate in any desired pattern with the contact springs of the rear board. In this way, a large number of circuits may be changed as often as desired. Previously established switching combinations can be stored for repeated use.





## RACK MOUNT SYSTEMS

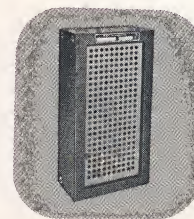


This new rack mount version of A-MP Patchcord Programming Systems saves as much as 50% in panel area over vertical installations. It can be installed as a recessed desk-top unit or placed within a console or racked-and-hinged panel assembly. Four standard size units are available. Each occupies only  $8\frac{3}{4}$ " of rack height and fits all standard 19" wide racks.

Rack mount systems incorporate all the quality and performance features of panel mount systems. A unique cam mechanism creates the same type of exclusive wiping action as found in the panel mount systems. The front and rear boards are engaged or disengaged when the panel door to the compartment containing the system is opened or closed.

## FIXED PANELS

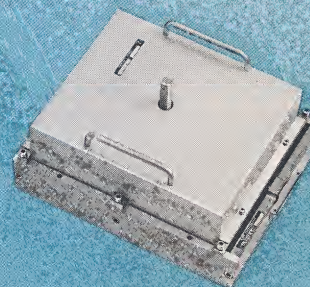
These panels are available in eight sizes to accommodate a variety of programming needs. A unit consists of a fixed board with contact springs that are permanently wired to the equipment in use, and a non-removable programming patchboard. With this arrangement, no engaging mechanism is needed. An A-MP Fixed Panel has, within the limitations of its design, the same features and serves similar programming needs as a panel mount or rack mount system.



## ANTI-VIBRATION PATCHCORD SYSTEMS

These systems are designed to withstand the highest extremes of vibration and shock. They are available in two sizes. One of these is designed to accommodate 806 contacts, the other 1280. Normally, both have frames and structural members made of machined stainless steel, but the smaller unit is available with aluminum frames. Both are supplied with a dust cover, 806 unit is made of aluminum, the 1280 is made of stainless steel.

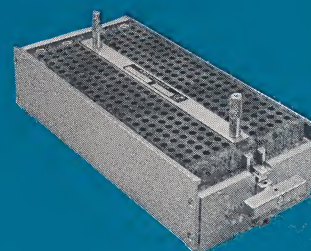
The chief design emphasis of these systems centers on properly securing the patchboard to the rear frame after contact mating has been achieved. This is accomplished with the use of a center post and six tie-down screws. The frame member has three pins protruding from the inside face. The center pin is longer than the others and serves as a polarizing pin to assure proper orientation of the patchboard. The pins on either side insure insertion at the "zero entry" position, serve as alignment pins, and provide an added measure of stability.



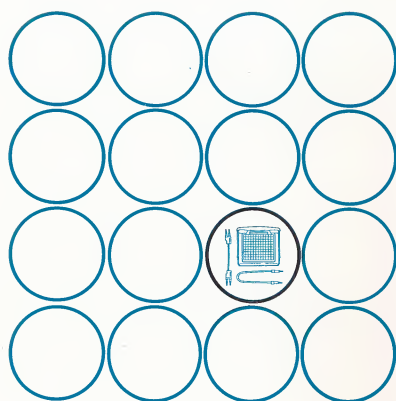
## AIRBORNE PATCHCORD SYSTEMS

Two standard sizes are available. They are designated as the "240" and "408" to correspond with the number of contacts each board will accept. The frames of these systems are machined from aluminum stock, and the engaging mechanisms are made of cadmium plated steel. Both can be completely programmed in a few seconds with changeable pre-programmed patchboards. The mechanical design for mating these boards with the rear frame and spring assembly affords firm seating of the patchcord plugs to resist excessive shock and vibration. It also provides for safe, easy removal of one patchcord for the substitution of another.

In addition to standard fastening devices, mating bosses are used: (1) to assure proper board alignment of the mating pin and hole arrangement and (2) as stop blocks to prevent board travel that would bend the contact springs beyond the point of yield.



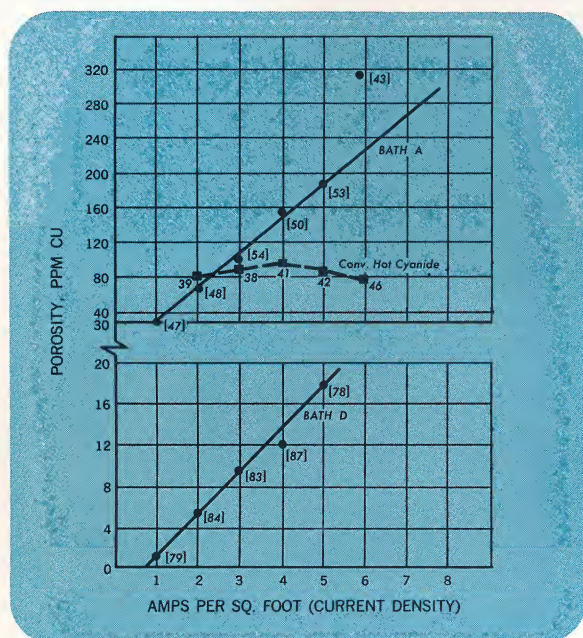




## AMP's plating technique

In all critical circuits gold is becoming mandatory. Since gold is costly, it is important to use the minimum plate thickness while maintaining high contact standards. AMP research revealed that gold, even applied to a thickness of .0001" did not prevent copper from migrating to the outer surface of the gold to form an oxide barrier. The problem was resolved by using nickel to a thickness of approximately .0001" as sub-plating. Gold over nickel plating was found to be suited both to the geometry of the product and repeated insertion and removal of patchcord pins.

This is why the following general standards for critical and non-critical applications of patchcord programming systems and panels have been established: In applications ranging between sensitive and critical, standard pin and contact spring platings consist of a minimum average of .00006" hard gold over .0001" minimum nickel. For non-critical applications electro-tin plating .0002" to .0004" thick is used on contact springs and .0001" minimum nickel on pins. For special applications other finishes will be supplied as required. All finishes assure dependable performance and long life contact surfaces, even under unfavorable environmental conditions.



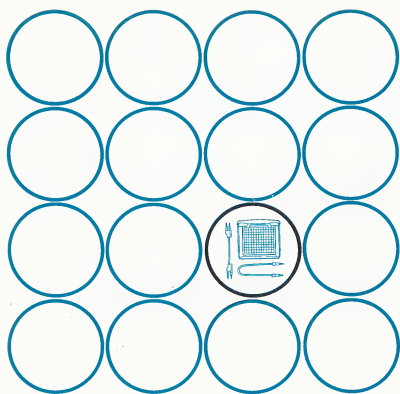
Linear plot of porosity vs. current density for three gold plating baths. Numbers show the actual average thickness for each lot. Samples for all three were taken from lots prepared by the bath manufacturer.

Another factor was found to be electro-plate porosity. This is defined either in terms of the relative amount of "empty" volume in the deposit or in the relative amount of exposed base area. AMP research teams discovered that different baths produced measurable differences in porosity. They also found for some particular baths the faster the rate of plating the greater the porosity. The linear relationship between current density and porosity is demonstrated in the above graph. The efficiency of the bath also seems to fall off above 5 amp/ft.<sup>2</sup>

These experiments did much to establish a system

of controls that now produces gold over nickel plating with porosity reduced almost to the vanishing point. Another notable AMP refinement is an exclusive X-ray technique so microscopically accurate that it measures plating thicknesses to the millionth of an inch. These two factors—low porosity and controlled plating thickness—have been found to be especially important in highly sensitive circuits where applied voltages are in millivolt regions. These facts are an urgent consideration to equipment manufacturers concerned with the necessity of meeting ever-tightening space-age requirements.





## Connections... a critical factor

The overall reliability of any electrical system depends largely on the mechanical integrity of its various connections. In the A-MP Universal Patchcord Systems and Panels there are four such points: (1) wire crimp to LANCELOK Terminal or Taper Pin, either of which connects the rear board of a system to equipment wiring; (2) contact between these terminals and the contact spring; (3) contact between spring and patchcord pin; (4) patchcord pin-to-wire crimped connection. (See figure 1.)

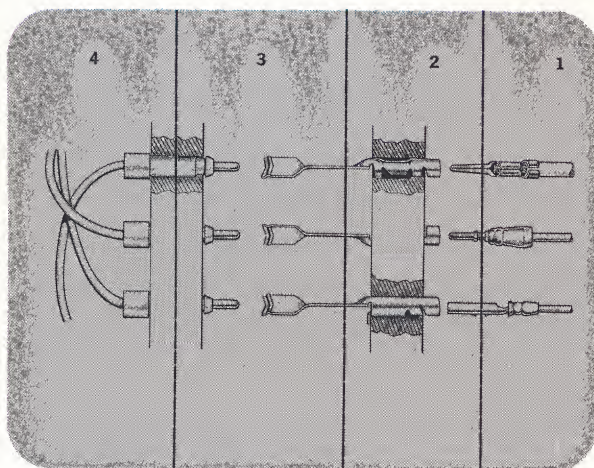


FIGURE 1

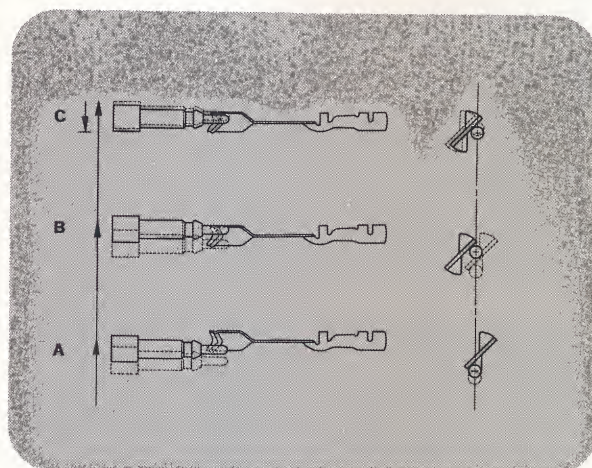


FIGURE 2

## AMP's double wiping action

The most critical of the connections referred to above is the contact between the contact springs of the permanent rear board and the patchcord pins of the removable board. AMP'S double wiping action incorporates a chevron design with a half-round, shallow V-shaped contact pod stamped in the blade of the contact spring. With a camming action involved when the springs and the patchcord pins are engaged, the 45° twist design of the contact spring causes the pins to slide across the chevrons. This action, under contact pressure of six to eight ounces, completely removes lint, dust and other surface contaminants from the contact areas of the springs and pins, thus assuring positive contact.

The action may be described as follows: (See fig. 2.)

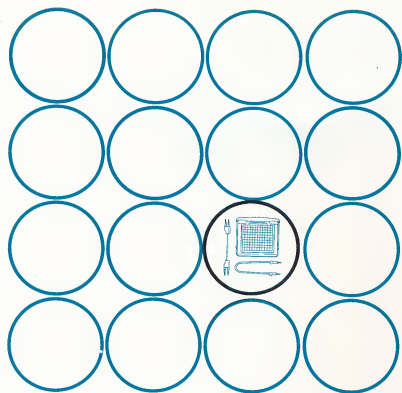
- A. With the engagement of the operating handle of the system, the patchcord pin moves upward to engage the chevron on the contact spring.
- B. The pin then moves upward and across the chevron to attain maximum travel while the unique design of the chevron wipes the core pin from back to front.
- C. Now the pin moves back from the point of maximum travel and rests in a previously wiped position.

Another advantage of the double wiping action is that the AMP design provides wiping action on a relatively

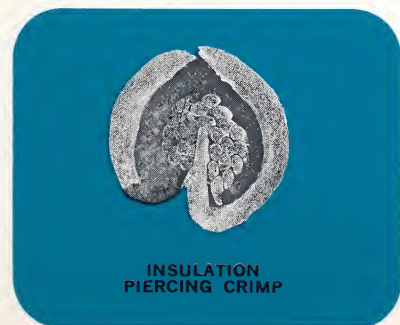
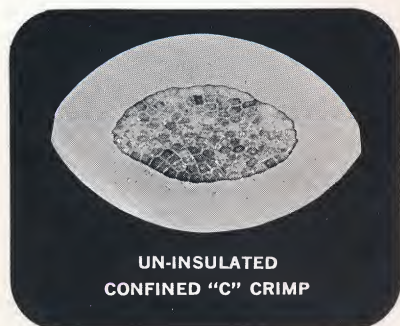
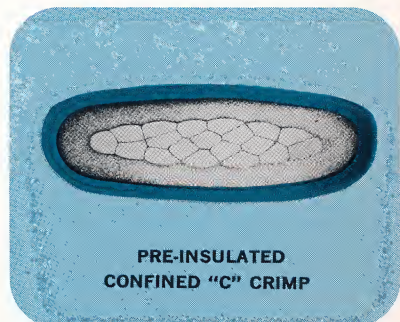
small area on the patchcord pin and a large area of the contact spring. The height of the chevron from base to apex determines the length of the wiping action of the patchcord pins, and the cam action determines the distance the pin travels back and forth along the length of the chevron. Since the chevron height is shallow and the system mechanism displacement relatively large, the total travel of the patchcord pins along the springs is compressed within a small linear distance on the pin. This results in maximum plating wear to the pin and minimum wear to the permanently mounted spring.

Why is this an important factor in the choice of a programming system? In the first place, many removable patchcords are frequently used with a single rear assembly. Secondly, the same contact metals and the same plating thicknesses are generally used for the patchcord pin and contact spring. Thirdly, frequent change of programming may demand, for example, that 10 patchboards be engaged to and separated from the same rear frame assembly as many as 1,000 times. In that case, each patchcord pin would be wiped 1,000 times whereas the rear board contact springs would be wiped 10,000 times. This means that if engagement wear is concentrated on the springs, as it is with some systems, their useful life would end long before that of the pins, thus necessitating far more costly replacement of the rear, fully wired board.





## ***AMP's matched terminal-tool crimping technique***



### **AMP MATCHED TERMINAL-TOOL CRIMPING TECHNIQUE**

Terminations produced with the AMP crimping method are virtually voidless, effectively bar contaminants and approach the strength of the conductor itself. They are formed into connections of optimum reliability by finely machined steel-alloy dies which bottom fully when precisely calibrated pressure is applied. This pressure is automatically released only when the cycle is completed and therefore results in identical, high-conductivity terminations. This type of termination technique is superior to thermal and other binding methods because: there is no danger of insulation burns or wire embrittlement; both solid wire and stranded wire are more readily and quickly crimped than soldered; crimped connections are more resistant than other types to shock, vibration and other environmental hazards; crimping with A-MP automatic tooling is faster — results in lower installed costs; and the AMP crimping method permits the ultimate flexibility in production procedures.

These advantages are supplemented by the most important consideration of all: The superiority of A-MP crimp terminations over thermal and wrap types. Unlike other methods with their human and mechanical variants and limitations, AMP compression crimping produces connections that are identical in appearance and performance. Consistent testing also indicates that A-MP crimp terminations possess high tensile strength, low milli-volt drop, high resistance to corrosion, and relative immunity to vibration.



# ***Components of A-MP Universal Patchcord Programming Products***

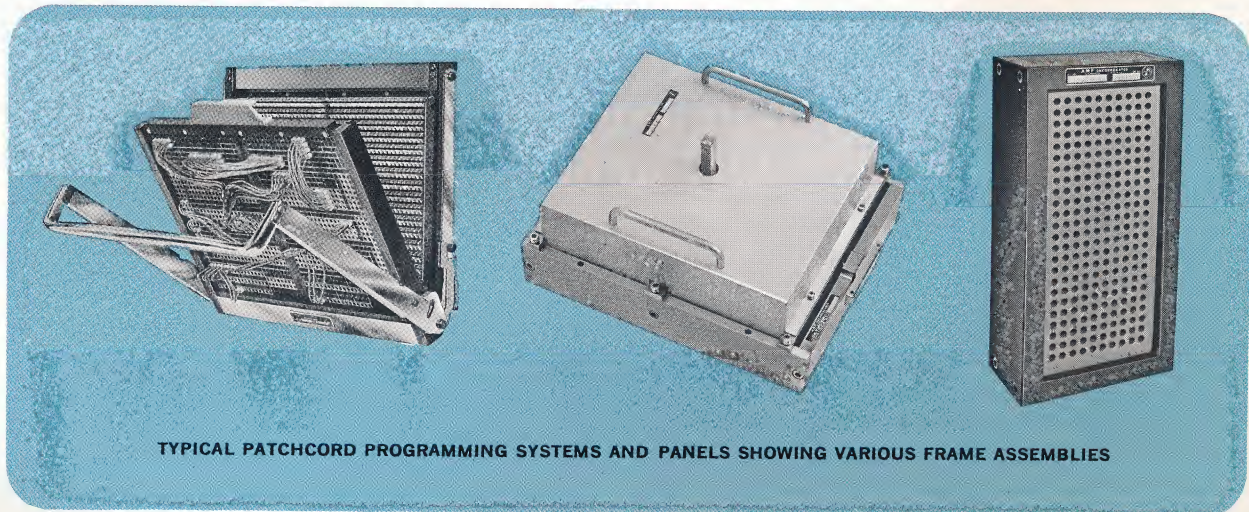
The merits of any electronic programming equipment are traceable to superiority of design, the materials used, exclusive advantageous features and the degree of precision applied in the manufacturing processes. All these values are combined in A-MP Patchcord

Programming Products. The same all-encompassing concept applies to every component used in both systems and panels. The following section contains descriptive material on these components as a guide for evaluation and comparison.

**FRAMES** Unless otherwise specified, the frames enclosing both the permanent and removable boards of A-MP Programming Systems and Panels are made of either stainless steel or aluminum. Aluminum is recommended for its weight saving factor. To assure

long life and good mechanical performance, steel is specified for operating linkages.

The frames of A-MP Anti-Vibration Systems are considerably heavier than the standard types. They are constructed to provide extra vibration and shock resist-



TYPICAL PATCHCORD PROGRAMMING SYSTEMS AND PANELS SHOWING VARIOUS FRAME ASSEMBLIES

ance under stresses well beyond maximum rated severity of any environment for which they are designed.

All A-MP Systems and Panels, (with the exception of the 240 Panel Mount System) provide a mechanical

interlock that prevents damage to the contact springs. With the same exception, all removable programming patchboards have rails that protrude far enough from the surface of the board to prevent accidental dislodgment of the patchcords.



**PATCHBOARDS** The materials used in permanent and removable programming boards have been thoroughly tested for their dielectric, mechanical, thermal, and chemical properties. Of the many available, the allyls (diallyl phthalates) and phenolics have been found most adaptable to A-MP Programming Systems and Panels. Both are thermosetting types that are hardened into permanent shapes.

**THE GENERAL PURPOSE PHENOLICS** have good insulation characteristics. They are strong, rigid and dimensionally stable, and are unaffected by most oils, alcohol, weak acids, and a wide variety of solvents. They provide insulation resistance between adjacent contacts at  $10^{11}$  ohms under normal conditions. However, this resistance is affected by moisture; therefore this material should not be selected where stable resistance is a requirement. The phenolic patchboard conforms to requirements of MIL-M-14F, type MFH.

**DIALLYL PHTHALATE**, with insulation resistance of  $10^{13}$  ohms or better, is recommended for more critical installations. This material is high in arc resistance, has high dielectric strength, low dielectric loss and good mechanical properties. Moreover, it maintains these properties under high temperature and humidity conditions. It is recommended for use wherever stable insulation resistance and fungus immunity are required. The diallyl phthalate conforms to requirements of MIL-M-14F, type MDG.

**PERMANENT REAR BOARDS.** These boards are available completely loaded with contact springs or with any specified number of holes plugged or contact springs omitted. Special sizes utilizing the same materials and allowing similar latitude in final finishing specifications, will be supplied on request.

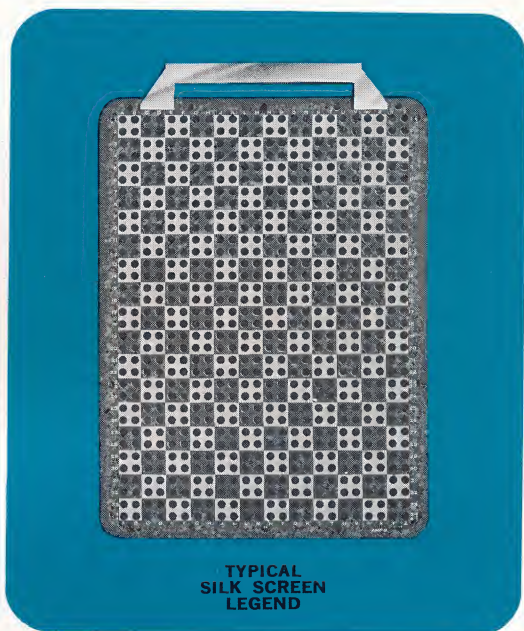
**SILK SCREENING.** Standard silk screen legends are available for each patchboard size, and special silk screen legends may be ordered to meet individual needs. Unless otherwise specified, standard rear frame spring assemblies are supplied with an alpha-numerical 2 x 2-hole checkerboard silk screen pattern.

**ELECTRICAL CHARACTERISTICS.** Contact springs in Universal Programming Systems and Panels have a self-inductance of .040 microhenries. The spring-to-spring capacitance with general purpose phenolic boards at 68° F. and relative humidity 50% is approximately 2.8 mmf; with diallyl phthalate boards it approximates 2.4 mmf. Capacitance between any one pin and its eight perimeter pins at 68° F. and relative humidity of 50% approximates 4.2 mmf for general purpose phenolic and 3.6 mmf for diallyl phthalate boards.

**Voltage Rating:** Recommended maximum operating voltage is 1500 volts DC and 1000 rms volts AC at sea level.



TYPICAL  
LARGE SYSTEM  
(UN-WIRED)



TYPICAL  
SILK SCREEN  
LEGEND

**CURRENT RATING. Contact Springs:** Maximum continuous current is five amperes per contact spring in an ambient temperature of 68° F. Current ratings as high as 25 amperes per contacts are permissible with an intermittent duty cycle. Where current ratings beyond five amperes are desired, AMP INCORPORATED should be contacted for recommendations.

**OPERATING TEMPERATURE.** The recommended maximum operating ambient temperature of A-MP Universal Patchcord Systems and Panels is 176° F. Should operation above this temperature be desired, we should be contacted.





**TWIN DETENT PATCHCORD**



**NYLON SLEEVE PATCHCORDS**



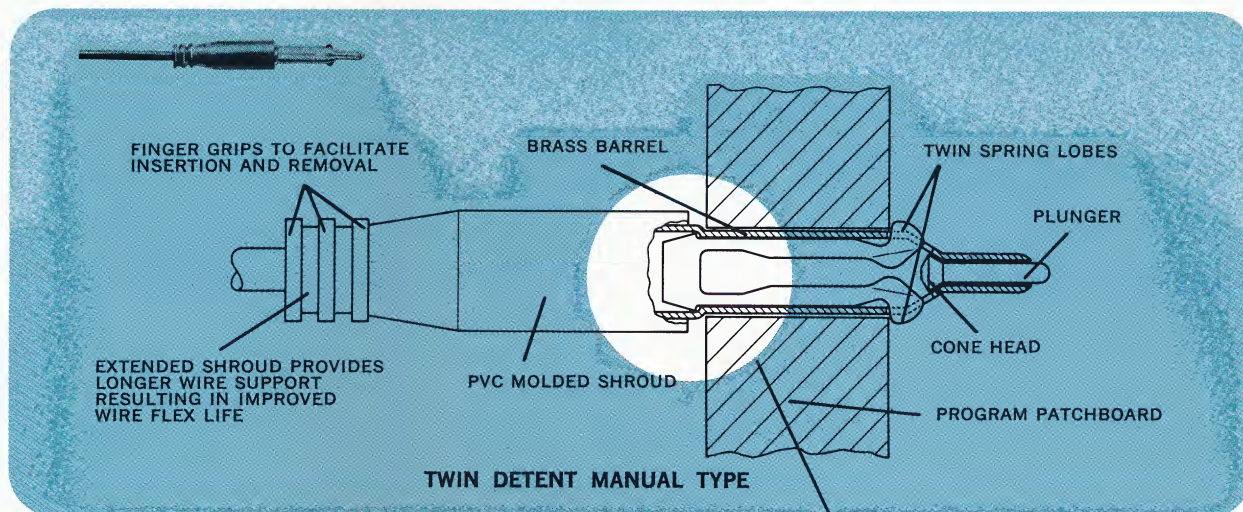
**PATCHCORDS** AMP supplies two basic types of patchcords—twin detent and nylon sleeve. Both have a number of attributes in common: Standard single, Y, and squids utilize #20 AWG gauge tinned copper wire, each strand .005" in diameter, with 41 strands per lead. Both are available with PVC outer insulation for higher dielectric values, higher temperature applications and the elimination of cord discoloration. Temperature range for this type insulation is  $-50^{\circ}$  to  $+105^{\circ}$  C, an ample spread for meeting MIL-W-16878 requirements with voltage rating of 1,000 volts DC. Both are compatible with fungus environments, and available in such special types as shunts, squids, and multiple-plug cords.

**TWIN DETENT PATCHCORDS.** Two types are available—the manual and semi-permanent versions. Both types come in lengths of 5" to 35" in increments of approximately 2" for the shorter lengths and 5" for the longer sizes. (See tabular data for types and sizes page 27.)

**THE MANUAL VERSION** of this type cord permits hand insertion and removal, but under normal conditions, the cord cannot be accidentally dislodged from the patchboard through pressure applied to the tips of the plugs. This

is accomplished with a twin detent spring within the barrel. The design and placement of the spring restricts longitudinal movement between the spring and the barrel. Retention lobes that protrude from the plug barrel are designed to permit normal hand insertion and removal of the plug from the patchboard with moderate pull. While the spring permits easy entry, the lobes once in "lock" position, provide enough detent retention to prevent accidental dislodgment of any pin, even when the board is placed face down on a cluttered work surface.

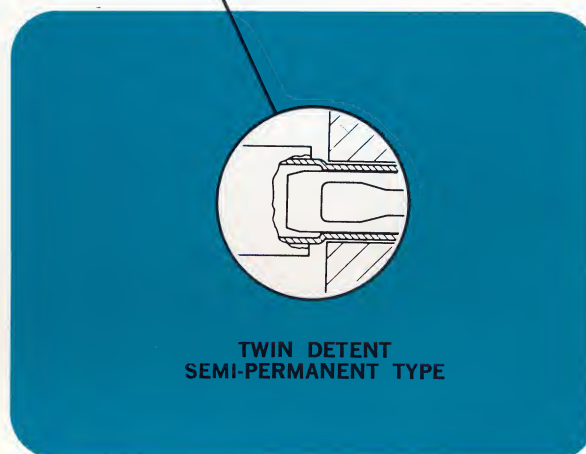




**THE SEMI-PERMANENT VERSION** does not confine the twin detent spring within a restricted position in the patchtip barrel. Longitudinal motion of the spring within the barrel is a requisite and is controlled by the length of the openings in the barrel through which the lobes project. When pull is exerted on the wire or patchtip shroud, the barrel moves in direct relation to the movement of the spring which, in turn, causes the plunger that projects from the tip of the pin to be pulled against the lobes. This is the motion that locks the cord firmly in the patchboard. Should the board then be placed on a cluttered work area and subject individual pins to pressure, the plunger of any pin thus affected would be depressed. This permits the cone head of the plunger to cause engagement with the spring lobes—a unique action that forces the lobes outward to prevent dislodgment of the patchtip.

Another advantage of Twin Detent Patchcords with dual spring lobes is that they greatly minimize chipping of the patchboard surface around the edges of the holes that accommodate them. With dual lobes, the plunger force is dissipated over a larger patchboard surface area, thus reducing the pressure of the spring lobes against the vulnerable portion of the patchboard surface.

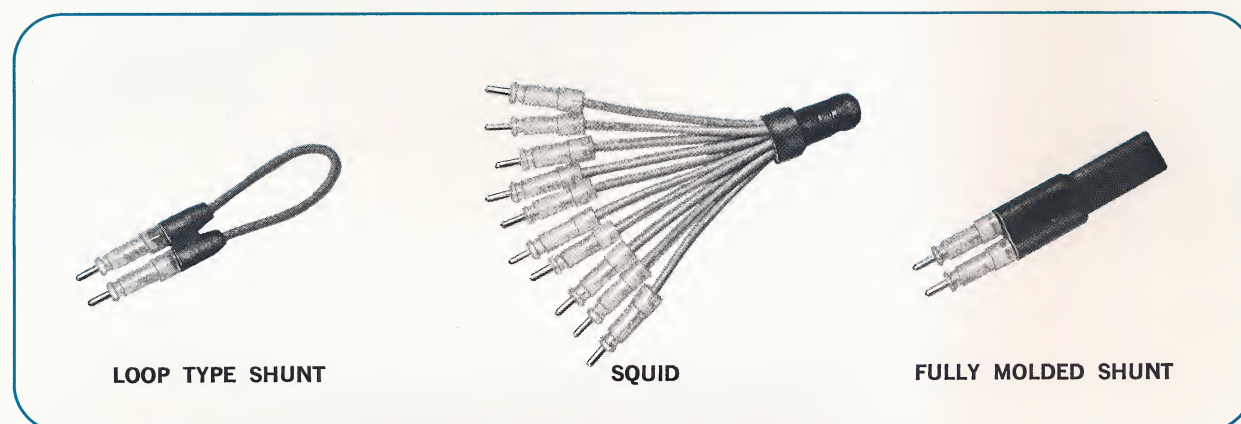
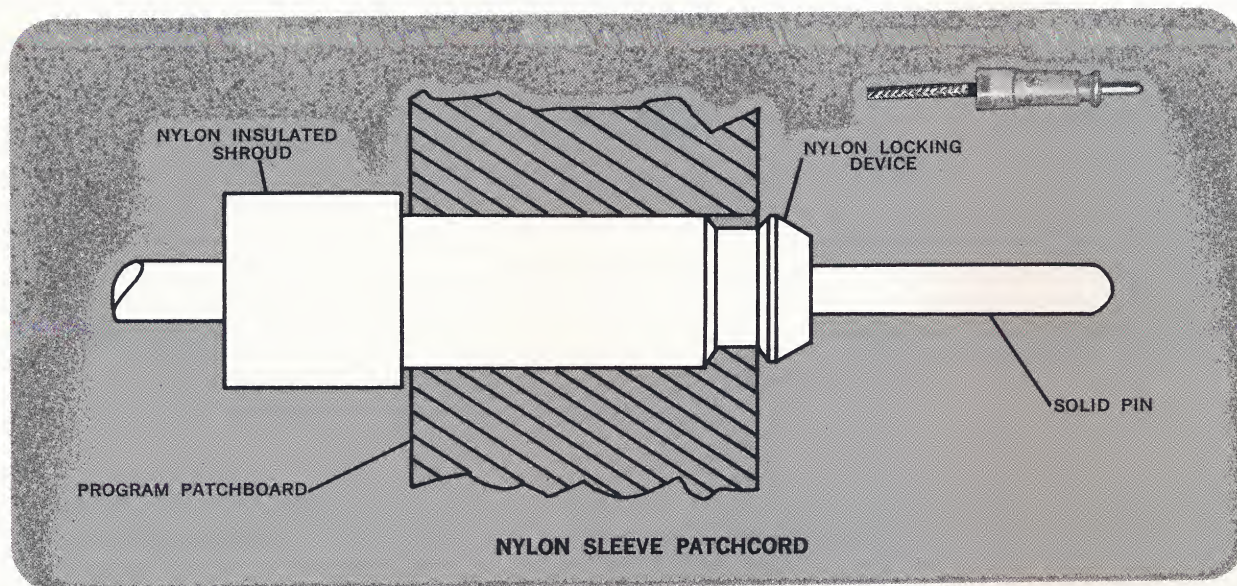
An extraction tool is required for removing semi-permanent twin detent patchcords. It is inserted over the patchcord pin to depress the spring lobes into the barrel, thus permitting easy removal. (See tooling section page 17.)



**NYLON SLEEVE PATCHCORDS.** These cords are available in the same lengths as Twin Detent Patchcords. They are designed for positive seating in the programming board and for rapid, reliable post-patching whenever required. The conductor in Nylon Sleeve Patchcords is insulated with poly-vinyl chloride.

The nylon sleeve snapped over the upper, non-contact portion of the pin assembly serves a double purpose: (1) it effectively insulates the crimped connection; (2) it is made with a beveled shoulder which provides sufficient detent pull resistance in the molded "D" shaped hole of the programming board, after insertion of the patchcord pin.





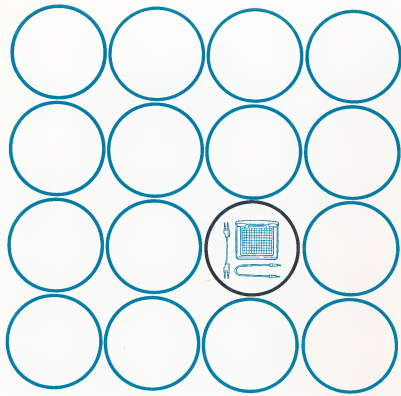
**PATCHCORD STYLES.** In addition to single conductor patchcords, the following types may be ordered, as required, for any Universal System or Panel: (1) multiple conductor PVC-insulated patchcords with multiple twisted conductors and an overall shield and outer insulating jacket, both ends terminated with PVC-molded, color-coded plugs; (2) shunts consisting of a single-conductor with its two pins molded together for insertion in adjacent holes; (3) "Y" cords with as many as eight leads emanating from a single insulated A-MP solderless butt connector; (4) squid patchcords with up to 10 leads attached to a single A-MP solderless closed-end connector; (5) dual cords with both tips molded together.

**ACCESSORIES.** Standard type patchcord accessories are available in a wide variety of adapters to meet every possible requirement. A complete listing is to be found on pages 30, 35 and 36.

**CONTACT RESISTANCE.** The average contact resistance between gold-plated patchcord pins and contact springs is rated at approximately .002 ohms, and stability is achieved down to low micro-volt levels. This combination of low resistance and a high stability factor is recommended for critical, low-level patchcord programming, especially when repeated contact resistance is unavoidable and maximum contact life is an important requisite.

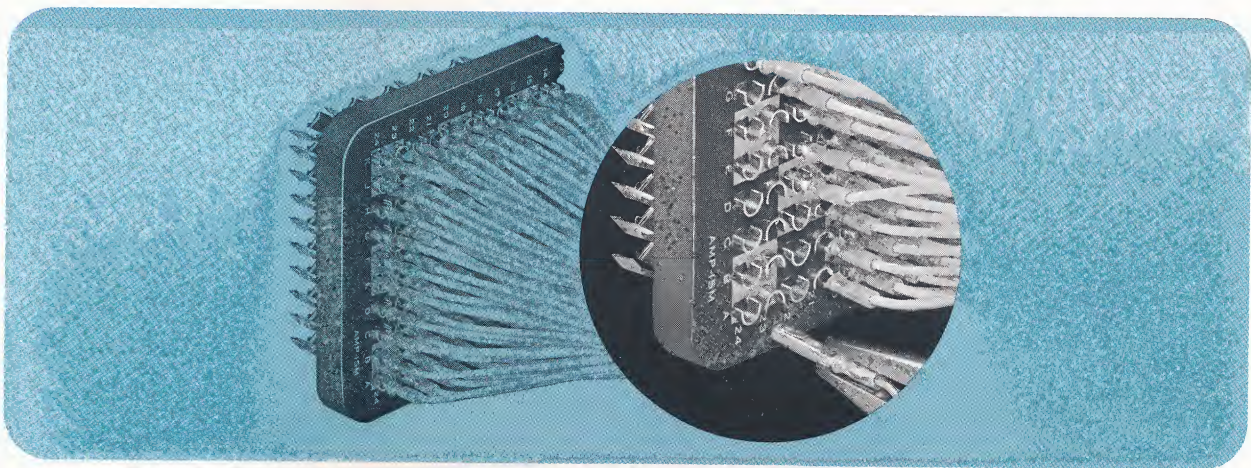
At an open circuit voltage greater than 20 volts, in non-critical applications, nickel-plated patchcord pins and tin-plated contact springs provide satisfactory performance. Here the average contact resistance is .005 ohms. This plating is not recommended for application requiring stable contact resistance nor when circuit parameters do not tolerate as much as a .5 volt drop in contact connections.





## Installation wiring of rear boards

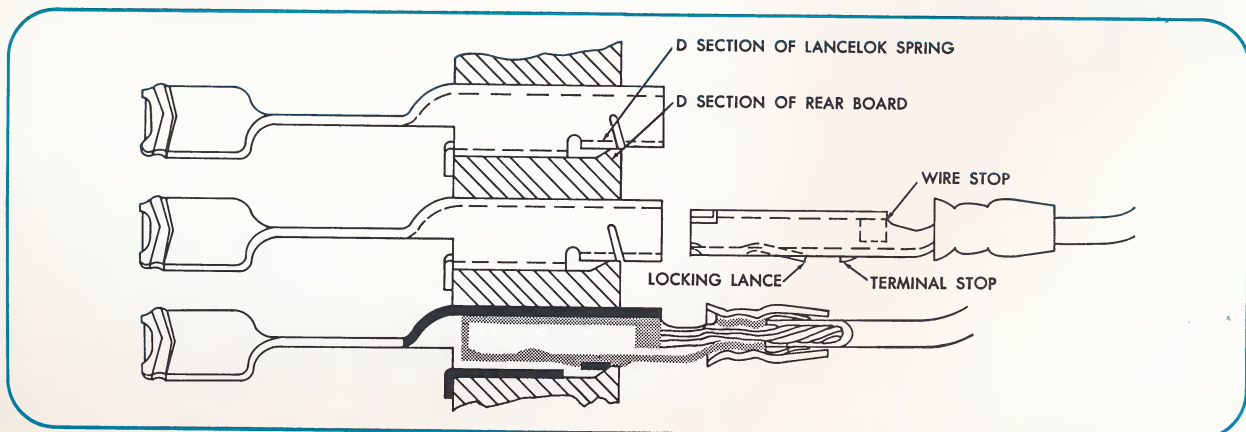
Rear Board wiring of Universal Patchcord Systems and Panels is accomplished with two types of terminations. Each of these — LANCELOK terminals and A-MP taper pins — is precision engineered and subjected to the highest possible quality control in manufacturing. The following description outlines the basic differences of these two wiring techniques and supplies information as to the suitability of each for various applications.



**LANCELOK TERMINAL** The LANCELOK Terminal is recommended for patchcord programming systems subjected to an excess of vibration and shock. The design of this terminal and the LANCELOK spring receptacle provides a multiple contact area which results in excellent electrical performance. The terminal and receptacle are formed of fine-grain spring-tempered brass. A locking lance seats the terminal firmly in the spring receptacle, providing minimum retention force of 20 pounds between the terminal and the board. LANCELOK terminals are available in uninsulated and pre-insulated types. Both designs include insulation support.

LANCELOK terminals cannot be incorrectly installed; they are mechanically polarized with the "D" shaped section of the contact spring. Over-insertion is prevented through the use of a positive stop in the terminal body.

LANCELOK terminals meet the wire tensile strength and the dielectric (voltage) breakdown requirements of MIL-T-7928.

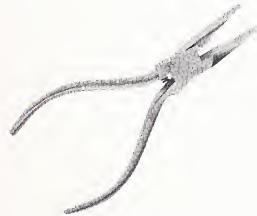




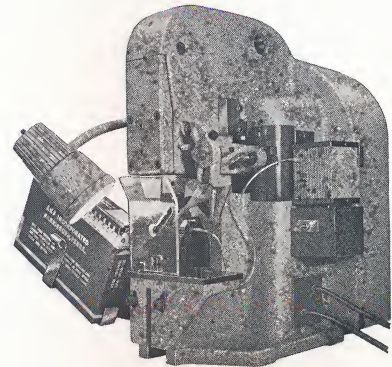
**LANCELOK TOOLING CERTI-CRIMP★** hand tools are used for crimping LANCELOK terminals during prototype operations as well as for making circuit changes and doing repair work. A pneumatic tape-fed tool is recommended for production runs. Both tools feature positive bottoming of crimping dies and adjustment for insulation support. Insertion or extraction is done with specially designed hand tools.



EXTRACTION TOOL



INSERTION TOOL



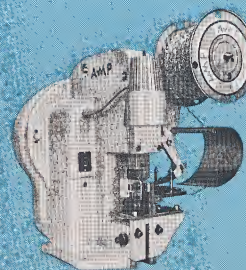
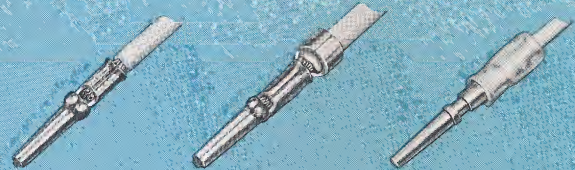
AMP-TAPETRONIC★  
MACHINE

**TAPER PINS** A-MP "53" series taper pins provide a low-resistance, noise-free wire termination. They have a  $3\frac{1}{2}^\circ$  taper which results in a .001" change in diameter for every .016" of length. This wedge provides uniform retention and excellent electrical stability.

Two general types of A-MP taper pins are available to meet every patchcord programming need. One is a formed pin available with or without insulation support. The other, designed for critical applications, is a PIDG★ pre-insulated solid pin featuring a closed barrel with a bonded nylon sleeve. Both critical and non-critical requirements can therefore be met at a cost consistent with each application.

**TAPER PIN CRIMP TOOLING** A portable bench-mounted machine is recommended for high-speed precision crimping of formed taper pins fed from a continuous strip. A pneumatic tool is available for tape-feeding and crimping solid pins. For prototype work and small production runs, CERTI-CRIMP hand tools are recommended. These contain a patented ratchet device that assures full bottoming of the dies before pressure can be released. With all tools, crimps issuing from the same pair of dies are identical in appearance and performance.

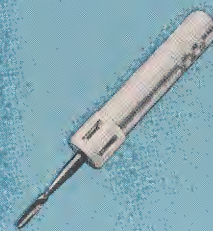
**INSERTION AND EXTRACTION TOOLING** The CERTI-LOK★ Insertion Tool contains a pull-test feature that assures proper seating of Series "53" Taper Pins in the contact spring receptacle without danger of damage to either component. This tool gives firm support to the pin and the wire during insertion and at the same time the precise amount of pressure needed to produce a connection with minimum retention force of seven pounds per contact. Like all A-MP tooling, the CERTI-LOK hand tool is precision built for close quality control. Thin line type extraction tool permits easy removal of taper pins in confined areas.



AMP-O-LECTRIC★  
MACHINE



CERTI-CRIMP HAND TOOL



INSERTION TOOL



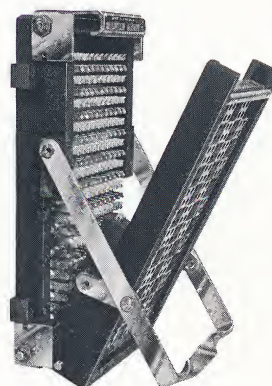
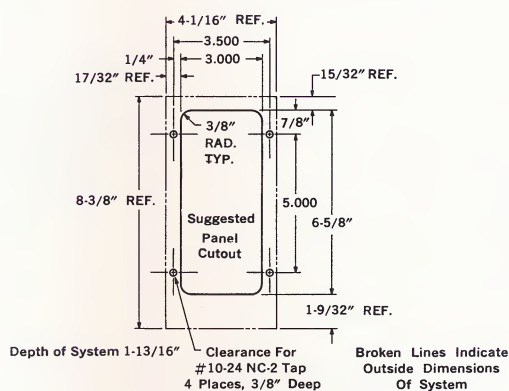
EXTRACTION TOOL



# Panel mount systems

## 240 system

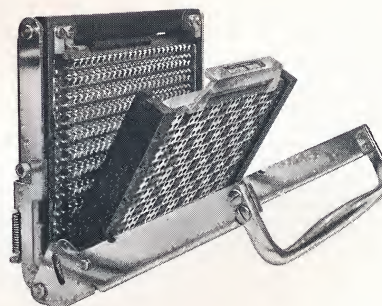
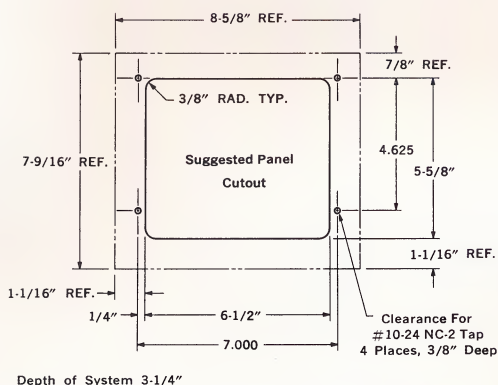
hole arrangement  
10 x 24



REAR FRAME AND SPRING ASSEMBLY					REMOVABLE PATCHBOARDS					
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER WITH "D" HOLES FOR NYLON SLEEVE PATCHCORDS		CATALOG NUMBER WITH ROUND HOLES FOR TWIN DETENT PATCHCORDS		NET WEIGHT
		FOR TAPER PIN WIRING	FOR LANCELOK TERMINAL WIRING			UNSCREENED	STANDARD SCREEN*	UNSCREENED	STANDARD SCREEN*	
General Purpose Phenolic	Tin Plated	595069-1	695672-1	2 lb., 8 oz.	General Purpose Phenolic	395056-1	595368-1	695670-1	695670-3	6 oz.
	Gold Plated	595069-2	695672-2							
Diallyl Phthalate	Tin Plated	595069-3	695672-3	2 lb., 7 oz.	Diallyl Phthalate	395056-2	595368-2	695670-2	695670-4	5 oz.
	Gold Plated	595069-4	695672-4							

## 480 system

hole arrangement  
24 x 20



REAR FRAME AND SPRING ASSEMBLY					REMOVABLE PATCHBOARDS					
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER WITH "D" HOLES FOR NYLON SLEEVE PATCHCORDS		CATALOG NUMBER WITH ROUND HOLES FOR TWIN DETENT PATCHCORDS		NET WEIGHT
		FOR TAPER PIN WIRING	FOR LANCELOK TERMINAL WIRING			UNSCREENED	STANDARD SCREEN*	UNSCREENED	STANDARD SCREEN*	
General Purpose Phenolic	Tin Plated	695305-1	695675-1	4 lb., 1 oz.	General Purpose Phenolic	595350-1	595534-1	695673-1	695673-3	13 oz.
	Gold Plated	695305-4	695675-2							
Diallyl Phthalate	Tin Plated	695305-2	695675-3	4 lb.	Diallyl Phthalate	595350-2	595534-2	695673-2	695673-4	12 oz.
	Gold Plated	695305-3	695675-4							

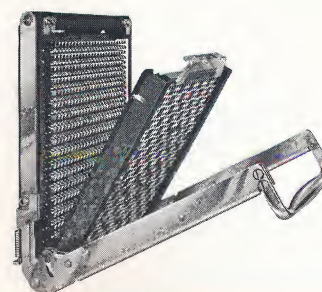
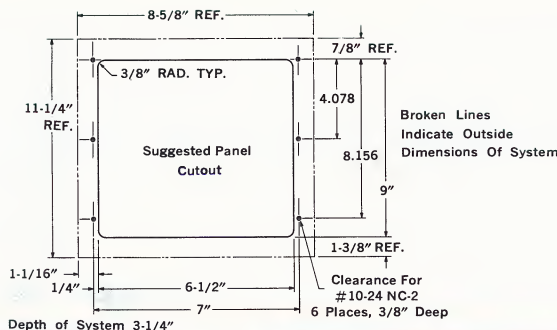
\*Front face of Patchboard is silk screened with alpha-numeric 2 x 2 checkerboard legend.

NOTE: Program Patchboards are recommended only for vertical engagement. Contact AMP for recommendations on other mounting arrangements.



# 816 system

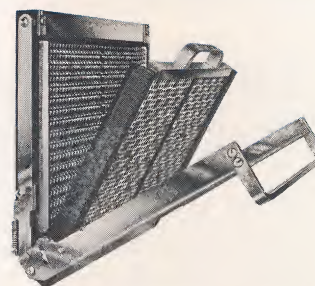
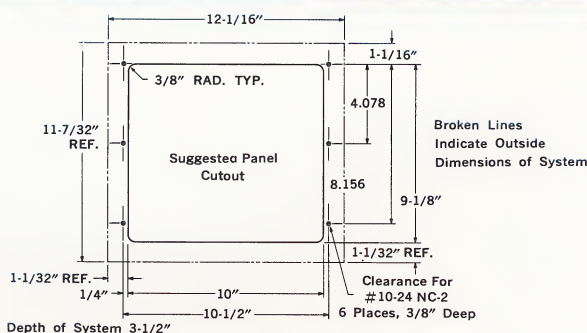
hole arrangement  
24 x 34



REAR FRAME AND SPRING ASSEMBLY					REMOVABLE PATCHBOARDS					
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER WITH "D" HOLES FOR NYLON SLEEVE PATCHCORDS		CATALOG NUMBER WITH ROUND HOLES FOR TWIN DETENT PATCHCORDS		NET WEIGHT
		FOR TAPER PIN WIRING	FOR LANCELOK TERMINAL WIRING			UNSCREENED	STANDARD SCREEN*	UNSCREENED	STANDARD SCREEN*	
General Purpose Phenolic	Tin Plated	695081-1	695678-1	7 lb.	General Purpose Phenolic	595005-1	595369-1	595902-1	595902-3	1 lb., 1 oz.
	Gold Plated	695081-4	695678-2							
Diallyl Phthalate	Tin Plated	695081-2	695678-3	6 lb., 15 oz.	Diallyl Phthalate	595005-2	595369-2	595902-2	595902-4	1 lb.
	Gold Plated	695081-3	695678-4							

# 1224 system

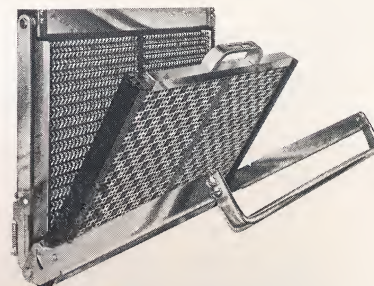
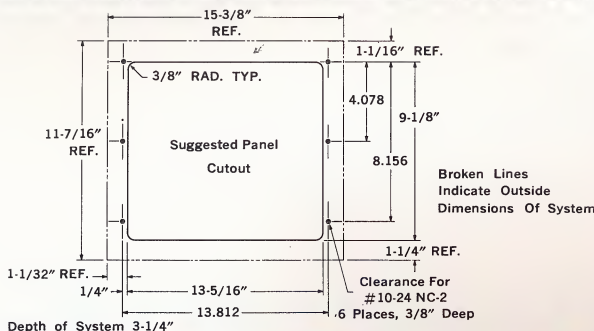
hole arrangement  
36 x 34



REAR FRAME AND SPRING ASSEMBLY					REMOVABLE PATCHBOARDS					
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER WITH "D" HOLES FOR NYLON SLEEVE PATCHCORDS		CATALOG NUMBER WITH ROUND HOLES FOR TWIN DETENT PATCHCORDS		NET WEIGHT
		FOR TAPER PIN WIRING	FOR LANCELOK TERMINAL WIRING			UNSCREENED	STANDARD SCREEN*	UNSCREENED	STANDARD SCREEN*	
General Purpose Phenolic	Tin Plated	695070-4	695681-1	14 lb., 4 oz.	General Purpose Phenolic	595109-1	695315-1	695679-1	695679-3	2 lb., 6 oz.
	Gold Plated	695070-2	695681-2							
Diallyl Phthalate	Tin Plated	695070-3	695681-3	14 lb., 2 oz.	Diallyl Phthalate	595109-2	695315-2	695679-2	695679-4	2 lb., 4 oz.
	Gold Plated	695070-1	695681-4							

# 1632 system

hole arrangement  
48 x 34



REAR FRAME AND SPRING ASSEMBLY					REMOVABLE PATCHBOARDS					
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER WITH "D" HOLES FOR NYLON SLEEVE PATCHCORDS		CATALOG NUMBER WITH ROUND HOLES FOR TWIN DETENT PATCHCORDS		NET WEIGHT
		FOR TAPER PIN WIRING	FOR LANCELOK TERMINAL WIRING			UNSCREENED	STANDARD SCREEN*	UNSCREENED	STANDARD SCREEN*	
General Purpose Phenolic	Tin Plated	695010-1	695684-1	17 lb., 12 oz.	General Purpose Phenolic	695009-1	695316-1	695682-1	695682-3	3 lb., 4 oz.
	Gold Plated	695010-2	695684-2							
Diallyl Phthalate	Tin Plated	695010-3	695684-3	17 lb., 8 oz.	Diallyl Phthalate	695009-2	695316-2	695682-2	695682-4	3 lb.
	Gold Plated	695010-4	695684-4							

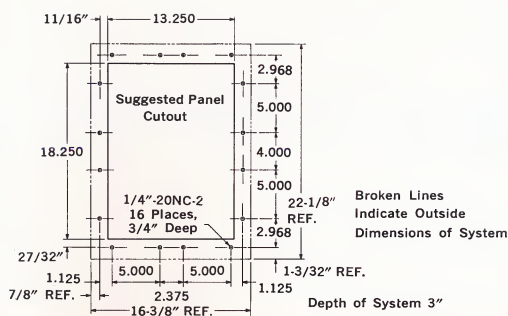
\*Front face of Patchboard is silk screened with alpha-numeric 2 x 2 checkerboard legend.

NOTE: Program Patchboards are recommended only for vertical engagement. Contact AMP for recommendations on other mounting arrangements.



# 3264 system

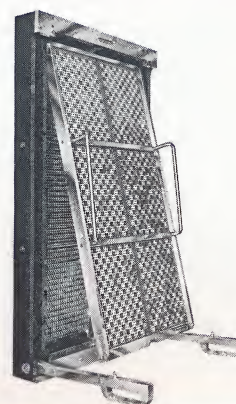
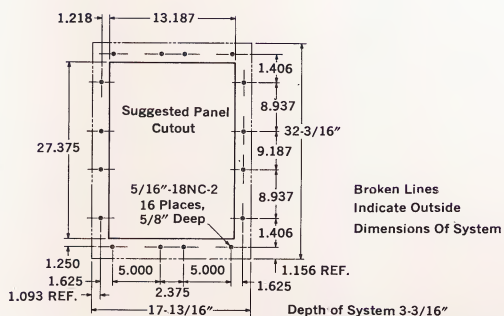
hole arrangement  
48 x 68



REAR FRAME AND SPRING ASSEMBLY					REMOVABLE PATCHBOARDS					
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER WITH "D" HOLES FOR NYLON SLEEVE PATCHCORDS		CATALOG NUMBER WITH ROUND HOLES FOR TWIN DETENT PATCHCORDS		NET WEIGHT
		FOR TAPER PIN WIRING	FOR LANCELOK TERMINAL WIRING			UNSCREENED	STANDARD SCREEN*	UNSCREENED	STANDARD SCREEN*	
General Purpose Phenolic	Tin Plated	695020-1	695657-1	24 lb., 11 oz.	General Purpose Phenolic	695017-1	695317-1	695466-1†	695466-3†	10 lb., 6 oz.
	Gold Plated	695020-2	695657-2			695415-1†	695415-3†			
Diallyl Phthalate	Tin Plated	695020-3	695657-3	24 lb., 3 oz.	Diallyl Phthalate	695017-2	695317-2	695466-2†	695466-4†	9 lb., 14 oz.
	Gold Plated	695020-4	695657-4			695414-2†	695415-4†			

# 4896 system

hole arrangement  
48 x 102

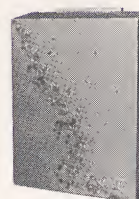


REAR FRAME AND SPRING ASSEMBLY					REMOVABLE PATCHBOARDS					
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER WITH "D" HOLES FOR NYLON SLEEVE PATCHCORDS		CATALOG NUMBER WITH ROUND HOLES FOR TWIN DETENT PATCHCORDS		NET WEIGHT
		FOR TAPER PIN WIRING	FOR LANCELOK TERMINAL WIRING			UNSCREENED	STANDARD SCREEN*	UNSCREENED	STANDARD SCREEN*	
General Purpose Phenolic	Tin Plated	695021-1	695689-1	53 lb., 14 oz.	General Purpose Phenolic	695019-1	695318-1	695451-1†	695451-3†	18 lb., 2 oz.
	Gold Plated	695021-2	695689-2			695416-1†	695416-3†			
Diallyl Phthalate	Tin Plated	695021-3	695689-3	53 lb., 2 oz.	Diallyl Phthalate	695019-2	695318-2	695451-2†	695451-4†	17 lb., 6 oz.
	Gold Plated	695021-4	695689-4			695416-2†	695416-4†			

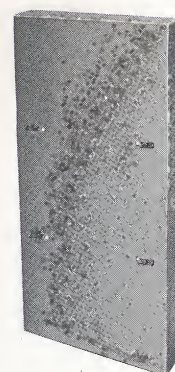
\*Front face of Patchboard is silk screened with alpha-numeric 2 x 2 checkerboard legend. Removable Program Patchboards are recommended only for vertical engagement. Contact AMP for recommendations on other mounting arrangements.  
†Aluminum Alloy Frame.

## DUST COVERS FOR REMOVABLE PROGRAM PATCHBOARDS

SYSTEM MODEL NO.	DUST COVER PART NO.	INSIDE DEPTH OF COVER	MATERIAL AND FINISH	TYPE
P240	595100-2	1-1/4"	Aluminum Alloy—Clear Anodized	A
P480	595757-1	2-3/16"	Aluminum Alloy—Clear Anodized	A
P816	595298-1	2-3/16"	Aluminum Alloy—Clear Anodized	A
P1224	695265-1	2-3/16"	Aluminum Alloy—Clear Anodized	A
P1632	695210-1	2-3/16"	Aluminum Alloy—Clear Anodized	B
P3264	695173-1	1-15/16"	Aluminum Alloy—Clear Anodized	B
P4896	695253-1	3-1/2"	Aluminum Alloy—Clear Anodized	B



TYPE A



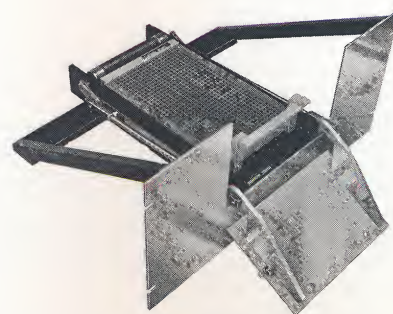
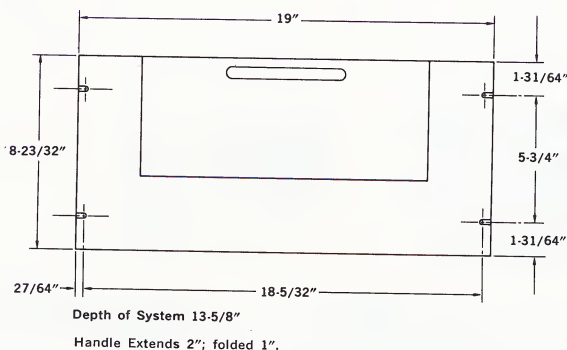
TYPE B



# Rack mount systems

## 680 system

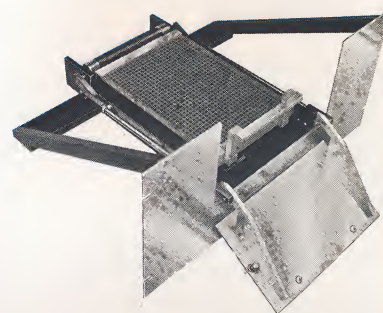
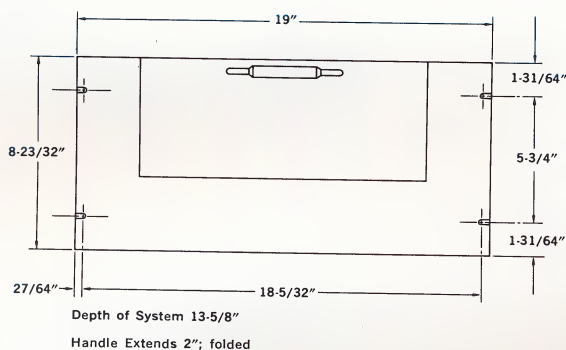
hole arrangement  
20 x 34



REAR FRAME AND SPRING ASSEMBLY					REMOVABLE PATCHBOARDS					
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER WITH "D" HOLES FOR NYLON SLEEVE PATCHCORDS		CATALOG NUMBER WITH ROUND HOLES FOR TWIN DETENT PATCHCORDS		NET WEIGHT
		FOR TAPER PIN WIRING	FOR LANCELOK TERMINAL WIRING			UNSCREENED	STANDARD SCREEN*	UNSCREENED	STANDARD SCREEN*	
General Purpose Phenolic	Tin Plated	497149-1	497149-5	16 lb., 11 oz.	General Purpose Phenolic	497159-1	497159-3	497159-5	497159-7	1 lb., 7 oz.
	Gold Plated	497149-2	497149-6							
Diallyl Phthalate	Tin Plated	497149-3	497149-7	16 lb., 10 oz.	Diallyl Phthalate	497159-2	497159-4	497159-6	497159-8	1 lb., 6 oz.
	Gold Plated	497149-4	497149-8							

## 816 system

hole arrangement  
24 x 34



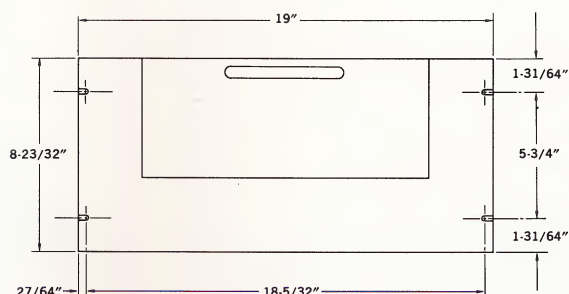
REAR FRAME AND SPRING ASSEMBLY					REMOVABLE PATCHBOARDS					
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER WITH "D" HOLES FOR NYLON SLEEVE PATCHCORDS		CATALOG NUMBER WITH ROUND HOLES FOR TWIN DETENT PATCHCORDS		NET WEIGHT
		FOR TAPER PIN WIRING	FOR LANCELOK TERMINAL WIRING			UNSCREENED	STANDARD SCREEN*	UNSCREENED	STANDARD SCREEN*	
General Purpose Phenolic	Tin Plated	497129-1	497129-5	17 lb., 6 oz.	General Purpose Phenolic	497128-1	497128-3	497128-5	497128-7	1 lb., 12 oz.
	Gold Plated	497129-2	497129-6							
Diallyl Phthalate	Tin Plated	497129-3	497129-7	17 lb., 4 oz.	Diallyl Phthalate	497128-2	497128-4	497128-6	497128-8	1 lb., 10 oz.
	Gold Plated	497129-4	497129-8							

\*Front face of Patchboard is silk screened with alpha-numeric 2 x 2 checkerboard legend.

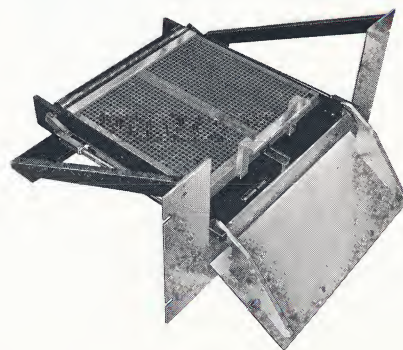


# 1224 system

hole arrangement  
36 x 34



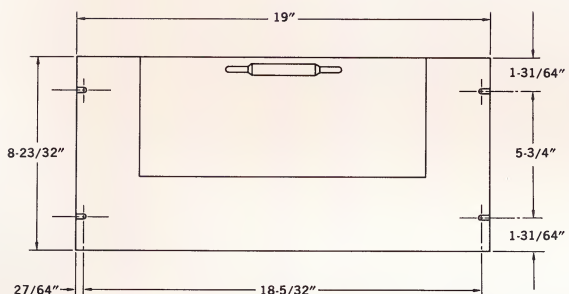
Depth of System 13-5/8"  
Handle Extends 2"; folded 1".



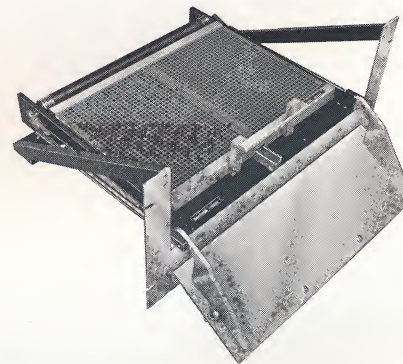
REAR FRAME AND SPRING ASSEMBLY					REMOVABLE PATCHBOARDS					
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER WITH "D" HOLES FOR NYLON SLEEVE PATCHCORDS		CATALOG NUMBER WITH ROUND HOLES FOR TWIN DETENT PATCHCORDS		NET WEIGHT
		FOR TAPER PIN WIRING	FOR LANCELOK TERMINAL WIRING			UNSCREENED	STANDARD SCREEN*	UNSCREENED	STANDARD SCREEN*	
General Purpose Phenolic	Tin Plated	497141-1	497141-5	20 lb., 2 oz.	General Purpose Phenolic	497142-1	497142-3	497142-5	497142-7	2 lb., 10 oz.
	Gold Plated	497141-2	497141-6							
Diallyl Phthalate	Tin Plated	497141-3	497141-7	19 lb., 5 oz.	Diallyl Phthalate	497142-2	497142-4	497142-6	497142-8	2 lb., 7 oz.
	Gold Plated	497141-4	497141-8							

# 1632 system

hole arrangement  
48 x 34



Depth of System 13-5/8"  
Handle Extends 2"; folded 1".

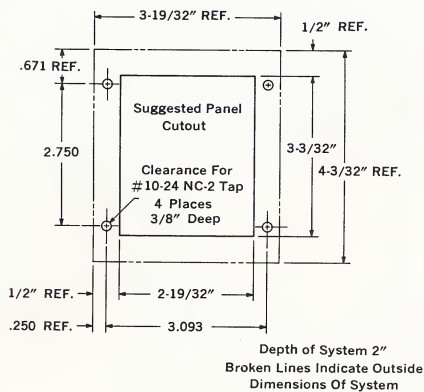


REAR FRAME AND SPRING ASSEMBLY					REMOVABLE PATCHBOARDS					
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER WITH "D" HOLES FOR NYLON SLEEVE PATCHCORDS		CATALOG NUMBER WITH ROUND HOLES FOR TWIN DETENT PATCHCORDS		NET WEIGHT
		FOR TAPER PIN WIRING	FOR LANCELOK TERMINAL WIRING			UNSCREENED	STANDARD SCREEN*	UNSCREENED	STANDARD SCREEN*	
General Purpose Phenolic	Tin Plated	497095-1	497095-5	22 lb., 2 oz.	General Purpose Phenolic	497086-1	497086-3	497086-5	497086-7	3 lb., 5 oz.
	Gold Plated	497095-2	497095-6							
Diallyl Phthalate	Tin Plated	497095-3	497095-7	21 lb., 14 oz.	Diallyl Phthalate	497086-2	497086-4	497086-6	497086-8	3 lb., 1 oz.
	Gold Plated	497095-4	497095-8							

\*Front face of Patchboard is silk screened with alpha-numeric 2 x 2 checkerboard legend.



# Fixed panels

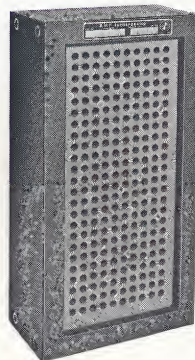
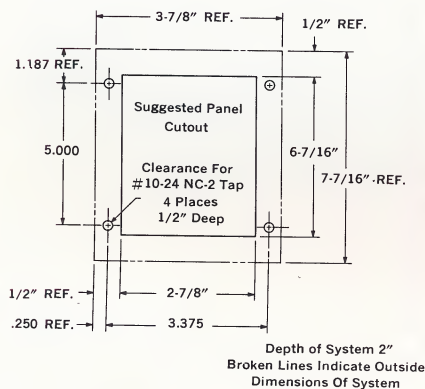


## 120 panel

(10 x 12)

Accepts Nylon Sleeve Patchcords

		CATALOG NUMBER		
BOARD MATERIAL	CONTACT SPRING FINISH	FOR TAPER PIN REAR WIRING		NET WEIGHT
General Purpose Phenolic	Tin Plated	495255-1		1 lb., 8 oz.
	Gold Plated	495255-2		
Diallyl Phthalate	Tin Plated	495255-3		1 lb., 8 oz.
	Gold Plated	495255-4		

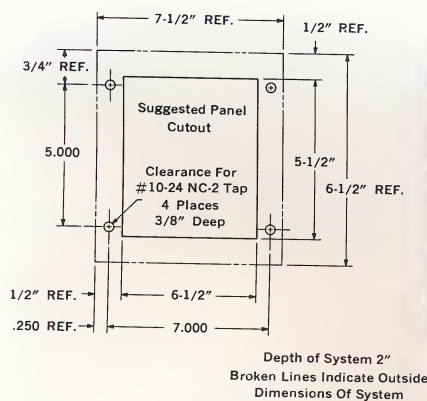


## 240 panel

(10 x 24)

Accepts Nylon Sleeve Patchcords

BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT
		FOR TAPER PIN REAR WIRING		
General Purpose Phenolic	Tin Plated	595035-1		2 lb., 14 oz.
	Gold Plated	595035-2		
Diallyl Phthalate	Tin Plated	595035-3		2 lb., 13 oz.
	Gold Plated	595035-4		

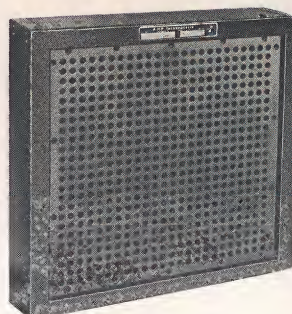
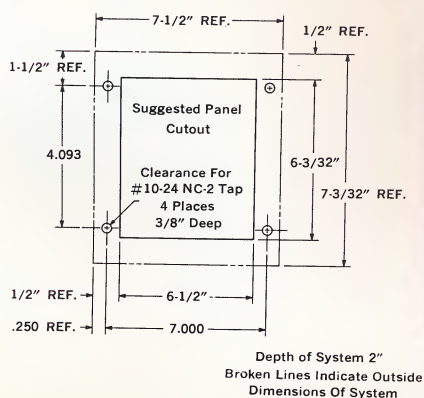


## 480 panel

(24 x 20)

Accepts Nylon Sleeve Patchcords

BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER		NET WEIGHT
		FOR TAPER PIN REAR WIRING		
General Purpose Phenolic	Tin Plated	595126-1		4 lb., 5 oz.
	Gold Plated	595126-2		
Diallyl Phthalate	Tin Plated	595126-3		4 lb., 3 oz.
	Gold Plated	595126-4		



## 576 panel

(24 x 24)

Accepts Nylon Sleeve Patchcords

CATALOG NUMBER			
BOARD MATERIAL	CONTACT SPRING FINISH	FOR TAPER PIN REAR WIRING	NET WEIGHT
General Purpose Phenolic	Tin Plated	595132-1	4 lb., 10 oz.
	Gold Plated	595132-2	
Diallyl Phthalate	Tin Plated	595132-3	4 lb., 7 oz.
	Gold Plated	595132-4	

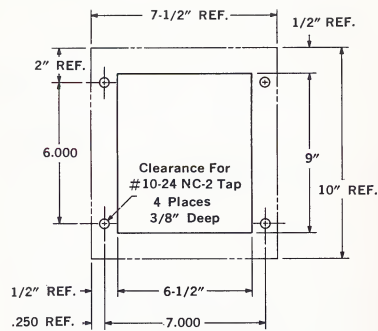
NOTE: Front face of fixed panels are not silk screened. Special screening or standard AMP alpha-numeric 2 x 2 checker board legend available upon request.



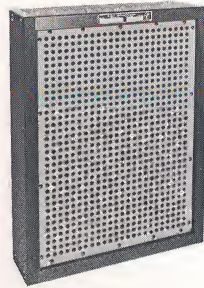
# 816 panel

(24 x 34)

Accepts Nylon Sleeve Patchcords



Depth of System 2"



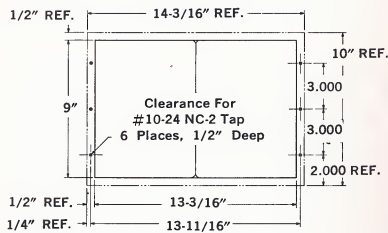
## CATALOG NUMBER

BOARD MATERIAL	CONTACT SPRING FINISH	FOR TAPER PIN REAR WIRING	NET WEIGHT
General Purpose Phenolic	Tin Plated	595051-1	6 lb., 14 oz.
	Gold Plated	595051-2	
Diallyl Phthalate	Tin Plated	595051-3	6 lb., 10 oz.
	Gold Plated	595051-4	

# 1632 panel

(48 x 34)

Accepts Nylon Sleeve Patchcords



Depth of System 2"



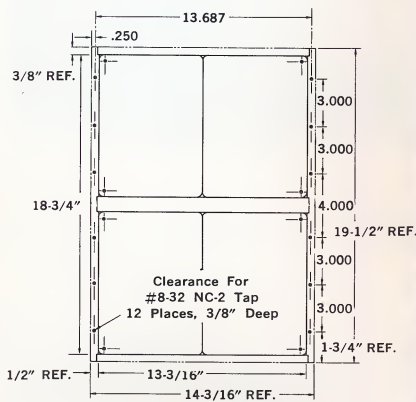
## CATALOG NUMBER

BOARD MATERIAL	CONTACT SPRING FINISH	FOR TAPER PIN REAR WIRING	NET WEIGHT
General Purpose Phenolic	Tin Plated	695142-1	13 lb., 4 oz.
	Gold Plated	695142-2	
Diallyl Phthalate	Tin Plated	695142-3	12 lb., 12 oz.
	Gold Plated	695142-4	

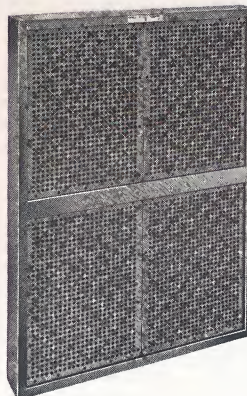
# 3264 panel

(48 x 68)

Accepts Nylon Sleeve Patchcords



Depth of System 2"



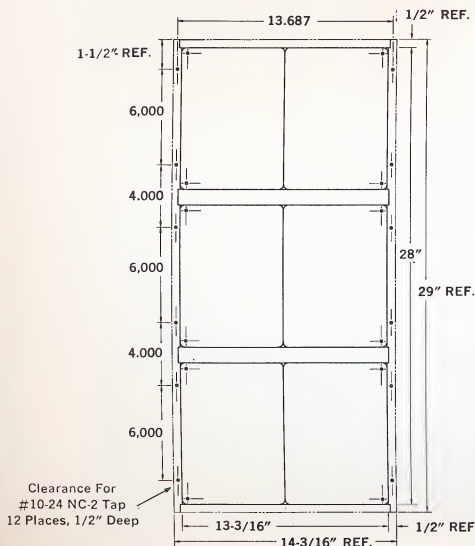
## CATALOG NUMBER

BOARD MATERIAL	CONTACT SPRING FINISH	FOR TAPER PIN REAR WIRING	NET WEIGHT
General Purpose Phenolic	Tin Plated	421083-1	20 lb., 13 oz.
	Gold Plated	421083-2	
Diallyl Phthalate	Tin Plated	421083-3	19 lb., 13 oz.
	Gold Plated	421083-4	

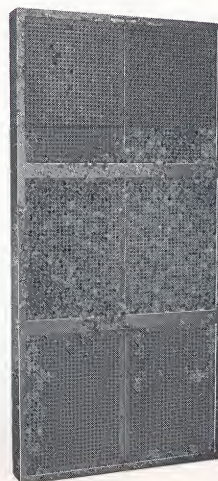
# 4896 panel

(48 x 102)

Accepts Nylon Sleeve Patchcords



Depth of System 2"



## CATALOG NUMBER

BOARD MATERIAL	CONTACT SPRING FINISH	FOR TAPER PIN REAR WIRING	NET WEIGHT
General Purpose Phenolic	Tin Plated	421084-1	30 lb., 9 oz.
	Gold Plated	421084-2	
Diallyl Phthalate	Tin Plated	421084-3	29 lb., 1 oz.
	Gold Plated	421084-4	

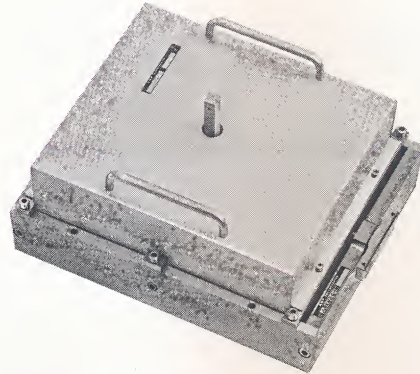
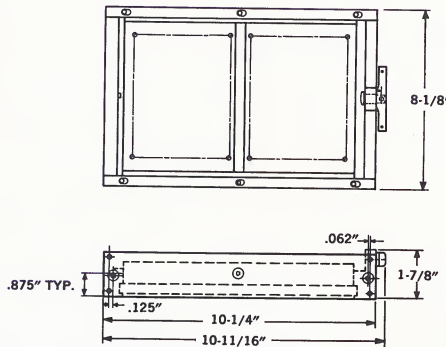
NOTE: Front face of fixed panels are not silk screened. Special screening or standard AMP alpha-numeric 2 x 2 checker board legend available upon request.



# Anti-vibration systems

## 806 system

hole arrangement  
31 x 26

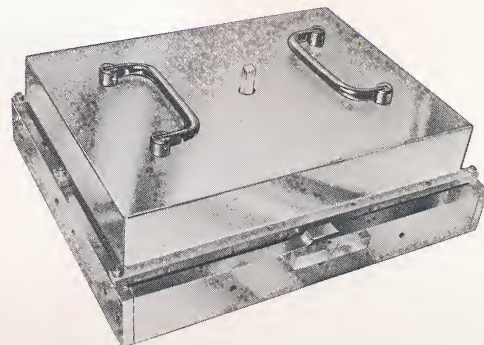
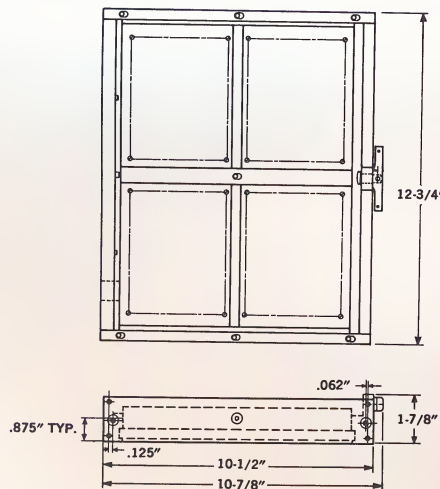


Accepts Twin Detent Patchcords

REAR FRAME AND SPRING ASSEMBLY				REMOVABLE PATCHBOARDS			DUST COVER		
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER FOR LANCELOK TERMINAL WIRING	NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER	NET WEIGHT	CATALOG NUMBER	MATERIAL & FINISH	NET WEIGHT
Diallyl Phthalate	Gold Plated	421299-2	8 lb. 4 oz.	Diallyl Phthalate	421300-2	2 lb. 5 oz.	421301-1	Clear Anodized Aluminum	12½ oz.

## 1280 system

hole arrangement  
32 x 40



Accepts Twin Detent Patchcords

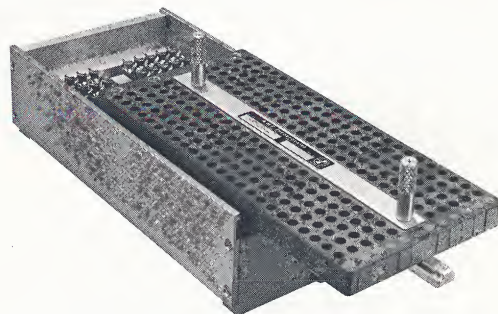
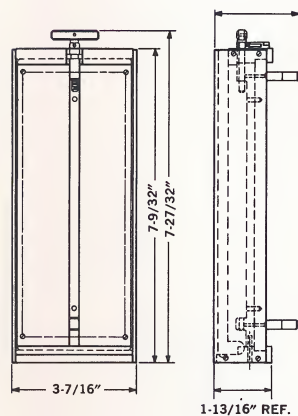
REAR FRAME AND SPRING ASSEMBLY				REMOVABLE PATCHBOARDS			DUST COVER		
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER FOR LANCELOK TERMINAL WIRING	NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER	NET WEIGHT	CATALOG NUMBER	MATERIAL & FINISH	NET WEIGHT
Diallyl Phthalate	Gold Plated	421302-2	19 lb.	Diallyl Phthalate	421303-2	6 lb.	421304-1	Stainless Steel	2 lb.



# Airborne Systems

## 240 system

hole arrangement  
10 x 24

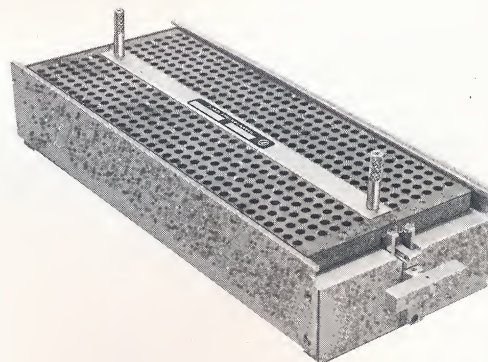
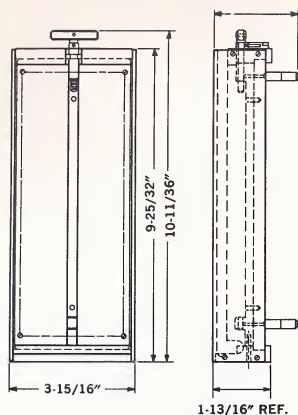


Accepts Nylon Sleeve Patchcords

REAR FRAME AND SPRING ASSEMBLY				REMOVABLE PATCHBOARDS "D" HOLE FOR NYLON SLEEVE PATCHCORDS			DUST COVER	
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER FOR TAPER PIN WIRING	NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER	NET WEIGHT	CATALOG NUMBER	MATERIAL & FINISH
General Purpose Phenolic	Tin Plated	595195-1	1 lb. 10 oz.	General Purpose Phenolic	595194-1	10 oz.	595179-1	Aluminum
	Gold Plated	595195-2						
Diallyl Phthalate	Tin Plated	595195-3	1 lb. 10 oz.	Diallyl Phthalate	595194-2	10 oz.	595179-2	Aluminum
	Gold Plated	595195-4						

## 408 system

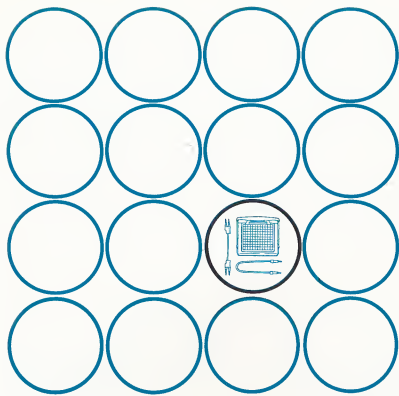
hole arrangement  
12 x 34



Accepts Nylon Sleeve Patchcords

REAR FRAME AND SPRING ASSEMBLY				REMOVABLE PATCHBOARDS "D" HOLE FOR NYLON SLEEVE PATCHCORDS			DUST COVER	
BOARD MATERIAL	CONTACT SPRING FINISH	CATALOG NUMBER FOR TAPER PIN WIRING	NET WEIGHT	BOARD MATERIAL	CATALOG NUMBER	NET WEIGHT	CATALOG NUMBER	MATERIAL & FINISH
General Purpose Phenolic	Tin Plated	420848-1	2 lb. 12 oz.	General Purpose Phenolic	420856-1	1 lb. 1 oz.		
	Gold Plated	420848-2						
Diallyl Phthalate	Tin Plated	420848-3	2 lb. 12 oz.	Diallyl Phthalate	420856-2	1 lb. 1 oz.		
	Gold Plated	420848-4						



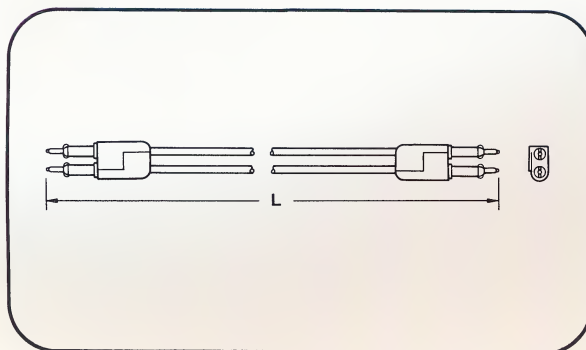
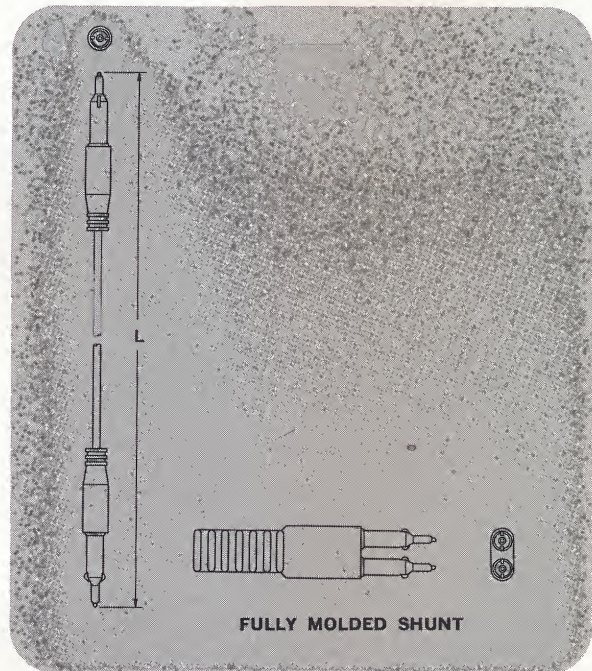


# ***Twin detent patchcords***

(FOR USE WITH ROUND HOLE  
FRONT BOARDS ONLY)

## **SINGLE CONDUCTOR PATCHCORDS — PVC INSULATED**

LENGTH (L)	PIN FINISH	CATALOG NO. MANUAL TYPE	CATALOG NO. SEMI-PERMA- NENT TYPE	INSULATION COLOR CODE
5"	Gold	695640-9	595903-9	Red
	Nickel	397345-9	397346-9	
7"	Gold	695640-1	595903-1	Gray
	Nickel	397345-1	397346-1	
9"	Gold	695640-2	595903-2	Blue
	Nickel	397345-2	397346-2	
11"	Gold	695640-3	595903-3	Green
	Nickel	397345-3	397346-3	
13"	Gold	695640-4	595903-4	Yellow
	Nickel	397345-4	397346-4	
15"	Gold	695640-5	595903-5	Orange
	Nickel	397345-5	397346-5	
19"	Gold	695640-6	595903-6	Black
	Nickel	397345-6	397346-6	
27"	Gold	695640-7	595903-7	Brown
	Nickel	397345-7	397346-7	
35"	Gold	695640-8	595903-8	Red
	Nickel	397345-8	397346-8	
Fully Molded Shunt	Gold	397347-1	397348-1	
	Nickel	397347-2	397348-2	



## **PATCHCORD DUAL CONDUCTOR**

LENGTH (L)	PIN FINISH	CATALOG NO. MANUAL TYPE	CATALOG NO. SEMI-PERMA- NENT TYPE	INSULATION COLOR CODE
7"	Gold	421100-1	421101-1	Gray & Black
9"	Gold	421100-2	421101-2	Blue & Black
11"	Gold	421100-3	421101-3	Green & Black
13"	Gold	421100-4	421101-4	Yellow & Black
15"	Gold	421100-5	421101-5	Orange & Black
19"	Gold	421100-6	421101-6	White & Black
27"	Gold	421100-7	421101-7	Brown & Black
35"	Gold	421100-8	421101-8	Red & Black





### SINGLE CONDUCTOR PLUS SHIELD PATCHCORDS — PVC INSULATED

LENGTH (L)	PIN FINISH	CATALOG NO. MANUAL TYPE	CATALOG NO. SEMI-PERMA- NENT TYPE	INSULATION COLOR CODE
7"	Gold	695644-1	695477-1	Gray
	Nickel	397349-1	397350-1	
9"	Gold	695644-2	695477-2	Blue
	Nickel	397349-2	397350-2	
11"	Gold	695644-3	695477-3	Green
	Nickel	397349-3	397350-3	
13"	Gold	695644-4	695477-4	Yellow
	Nickel	397349-4	397350-4	
15"	Gold	695644-5	695477-5	Orange
	Nickel	397349-5	397350-5	
19"	Gold	695644-6	695477-6	Black
	Nickel	397349-6	397350-6	
27"	Gold	695644-7	695477-7	Brown
	Nickel	397349-7	397350-7	
35"	Gold	695644-8	695477-8	Red
	Nickel	397349-8	397350-8	



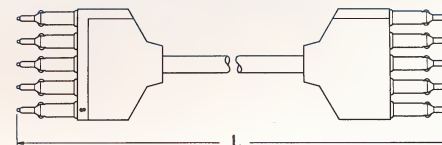
### TWO CONDUCTOR PLUS SHIELD PATCHCORDS — PVC INSULATED

LENGTH (L)	PIN FINISH	CATALOG NO. MANUAL TYPE	CATALOG NO. SEMI-PERMA- NENT TYPE	INSULATION COLOR CODE
7"	Gold	397351-1	397353-1	Black
	Nickel	397352-1	397354-1	
9"	Gold	397351-2	397353-2	Black
	Nickel	397352-2	397354-2	
11"	Gold	397351-3	397353-3	Black
	Nickel	397352-3	397354-3	
13"	Gold	397351-4	397353-4	Black
	Nickel	397352-4	397354-4	
15"	Gold	397351-5	397353-5	Black
	Nickel	397352-5	397354-5	
19"	Gold	397351-6	397353-6	Black
	Nickel	397352-6	397354-6	
27"	Gold	397351-7	397353-7	Black
	Nickel	397352-7	397354-7	
35"	Gold	397351-8	397353-8	Black
	Nickel	397352-8	397354-8	
45"	Gold	397351-9	397353-9	Black
	Nickel	397352-9	397354-9	



### THREE CONDUCTOR PLUS SHIELD PATCHCORDS — PVC INSULATED

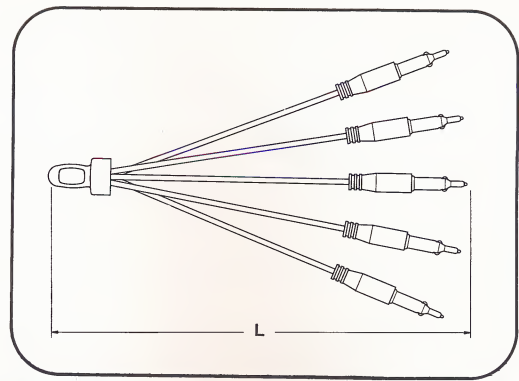
LENGTH (L)	PIN FINISH	CATALOG NO. MANUAL TYPE	CATALOG NO. SEMI-PERMA- NENT TYPE	INSULATION COLOR CODE
9"	Gold	695641-1	595905-1	Black
	Nickel	397355-1	397356-1	
11"	Gold	695641-2	595905-2	Black
	Nickel	397355-2	397356-2	
13"	Gold	695641-3	595905-3	Black
	Nickel	397355-3	397356-3	
15"	Gold	695641-4	595905-4	Black
	Nickel	397355-4	397356-4	
19"	Gold	695641-5	595905-5	Black
	Nickel	397355-5	397356-5	
24"	Gold	695641-6	595905-6	Black
	Nickel	397355-6	397356-6	
27"	Gold	695641-7	595905-7	Black
	Nickel	397355-7	397356-7	
40"	Gold	695641-8	595905-8	Black
	Nickel	397355-8	397356-8	



### FOUR CONDUCTOR PLUS SHIELD PATCHCORDS — PVC INSULATED

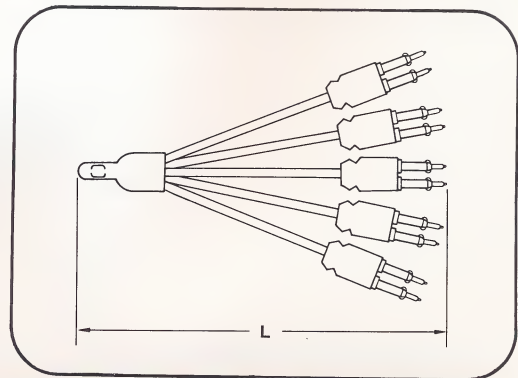
LENGTH (L)	PIN FINISH	CATALOG NO. MANUAL TYPE	CATALOG NO. SEMI-PERMA- NENT TYPE	INSULATION COLOR CODE
9"	Gold	397357-1	397359-1	Black
	Nickel	397358-1	397360-1	
11"	Gold	397357-2	397359-2	Black
	Nickel	397358-2	397360-2	
13"	Gold	397357-3	397359-3	Black
	Nickel	397358-3	397360-3	
15"	Gold	397357-4	397359-4	Black
	Nickel	397358-4	397360-4	
19"	Gold	397357-5	397359-5	Black
	Nickel	397358-5	397360-5	
24"	Gold	397357-6	397359-6	Black
	Nickel	397358-6	397360-6	
27"	Gold	397357-7	397359-7	Black
	Nickel	397358-7	397360-7	
40"	Gold	397357-8	397359-8	Black
	Nickel	397358-8	397360-8	





## SQUID PATCHCORDS — PVC INSULATED

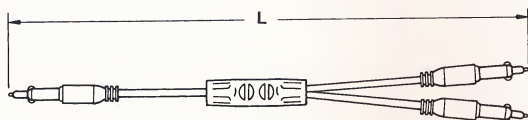
LENGTH (L)	PIN FINISH	PIN TYPE	CATALOG NUMBERS						INSULATION COLOR CODE
			3 PIN	4 PIN	5 PIN	6 PIN	7 PIN	8 PIN	
3"	Nickel	Manual Semi-Perm.	397369-1 397375-1	397370-1 397376-1	397371-1 397377-1	397372-1 397378-1	397373-1 397379-1	397374-1 397380-1	Orange
	Gold	Manual Semi-Perm.	695650-1 695472-1	397361-1 695769-1	397362-1 397041-1	397363-1 397366-1	397364-1 397367-1	397365-1 397368-1	
5"	Nickel	Manual Semi-Perm.	397369-2 397375-2	397370-2 397376-2	397371-2 397377-2	397372-2 397378-2	397373-2 397379-2	397374-2 397380-2	Red
	Gold	Manual Semi-Perm.	695650-2 695472-2	397361-2 695769-2	397362-2 397041-2	397363-2 397366-2	397364-2 397367-2	397365-2 397368-2	
7"	Nickel	Manual Semi-Perm.	397369-3 397375-3	397370-3 397376-3	397371-3 397377-3	397372-3 397378-3	397373-3 397379-3	397374-3 397380-3	Gray
	Gold	Manual Semi-Perm.	695650-3 695472-3	397361-3 695769-3	397362-3 397041-3	397363-3 397366-3	397364-3 397367-3	397365-3 397368-3	
9"	Nickel	Manual Semi-Perm.	397369-4 397375-4	397370-4 397376-4	397371-4 397377-4	397372-4 397378-4	397373-4 397379-4	397374-4 397380-4	Blue
	Gold	Manual Semi-Perm.	695650-4 695472-4	397361-4 695769-4	397362-4 397041-4	397363-4 397366-4	397364-4 397367-4	397365-4 397368-4	
11"	Nickel	Manual Semi-Perm.	397369-5 397375-5	397370-5 397376-5	397371-5 397377-5	397372-5 397378-5	397373-5 397379-5	397374-5 397380-5	Green
	Gold	Manual Semi-Perm.	695650-5 695472-5	397361-5 695769-5	397362-5 397041-5	397363-5 397366-5	397364-5 397367-5	397365-5 397368-5	



## SINGLE CONDUCTOR & SHIELD SQUIDS

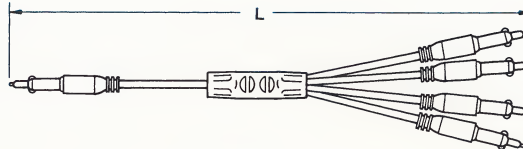
LENGTH (L)	PIN FINISH	PIN TYPE	3 LEGS	4 LEGS	5 LEGS	6 LEGS	7 LEGS	8 LEGS	INSULATION COLOR CODE
7"	Gold Tips	Semi-Perm. Manual	497304-1 420929-1	497305-1 421102-1	497321-1 421103-1	421106-1 421107-1	497342-1 421104-1	497340-1 421105-1	Grey
	Gold Tips	Semi-Perm. Manual	497304-2 420929-2	497305-2 421102-2	497321-2 421103-2	421106-2 421107-2	497342-2 421104-2	497340-2 421105-2	
11"	Gold Tips	Semi-Perm. Manual	497304-3 420929-3	497305-3 421102-3	497321-3 421103-3	421106-3 421107-3	497342-3 421104-3	497340-3 421105-3	Green
	Gold Tips	Semi-Perm. Manual	497304-4 420929-4	497305-4 421102-4	497321-4 421103-4	421106-4 421107-4	497342-4 421104-4	497340-4 421105-4	
15"	Gold Tips	Semi-Perm. Manual	497304-5 420929-5	497305-5 421102-5	497321-5 421103-5	421106-5 421107-5	497342-5 421104-5	497340-5 421105-5	Orange
	Gold Tips	Semi-Perm. Manual	497304-6 420929-6	497305-6 421102-6	497321-6 421103-6	421106-6 421107-6	497342-6 421104-6	497340-6 421105-6	
27"	Gold Tips	Semi-Perm. Manual	497304-7 420929-7	497305-7 421102-7	497321-7 421103-7	421106-7 421107-7	497342-7 421104-7	497340-7 421105-7	Brown
	Gold Tips	Semi-Perm. Manual	497304-7 420929-7	497305-7 421102-7	497321-7 421103-7	421106-7 421107-7	497342-7 421104-7	497340-7 421105-7	





**"Y" PATCHCORD — 3 PIN COMMON**  
(Semi-Permanent)

LENGTH IN INCHES	PIN FINISH	PART NUMBER	INSULATION COLOR
9"	Gold	397728-1	Blue
15"	Gold	397728-2	Orange



**"Y" PATCHCORD — 5 PIN COMMON**  
(Semi-Permanent)

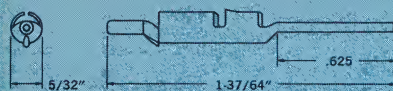
LENGTH IN INCHES	PIN FINISH	PART NUMBER	INSULATION COLOR
9"	Gold	397733-1	Blue
15"	Gold	397733-2	Orange

## Accessories

FOR TWIN DETENT  
PATCHCORDS

### WRAP-TYPE POST ADAPTER

For wrap-type connections.



#### CATALOG NO.

#### FINISH

497474-3

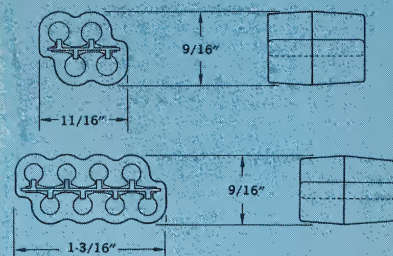
Gold Plated

497474-2

Tin Plated

### COMMONING BLOCK

For electrical commoning  
of two or more patchtips.



#### NO. OF HOLES

#### CATALOG NO.

#### FINISH

4

397805-2

Nickel Plated

397805-1

Gold Plated

8

397806-2

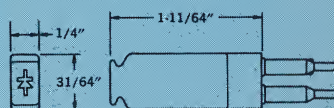
Nickel Plated

397806-1

Gold Plated

### DIODE PATCHCORD SHUNT

(Semi-Permanent)



497477

Gold Plated

### EXTRACTION TOOL & SPARE TIPS

For semi-permanent Twin Detent  
patchtips (Tip included)



#### TIP LENGTH

#### CATALOG NO.

#### TIP NO.

5/8"

695880-1

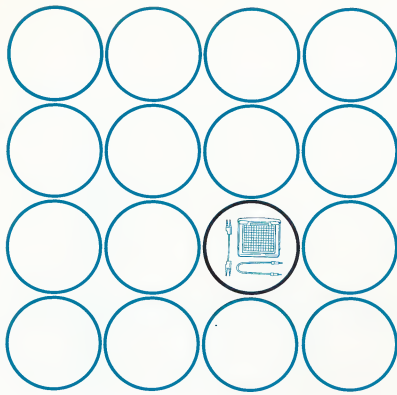
695879-1

4"

695880-2

695879-2



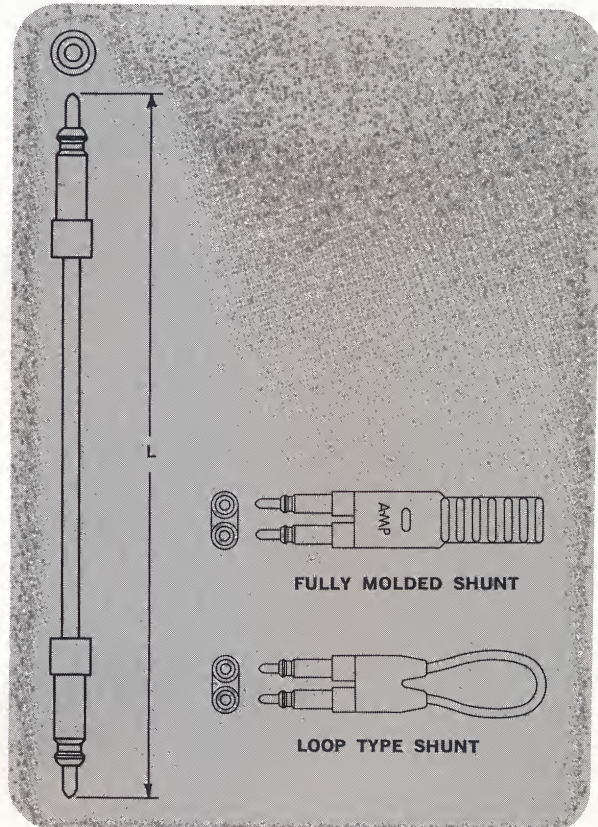
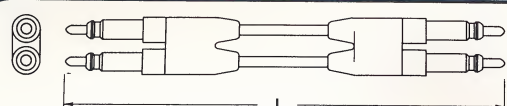


# Nylon sleeve patchcords

FOR USE WITH "D" HOLE  
FRONT BOARDS ONLY


## SINGLE CONDUCTOR PATCHCORDS

LENGTH (L)	TIP FINISH	PVC INSULATED CATALOG NO.	INSULATION COLOR
3"	Nickel	395633-2	Orange
	Gold	395633-1	
5"	Nickel	395330-1	Red
	Gold	395223-2	
7"	Nickel	395330-2	Grey
	Gold	395223-3	
9"	Nickel	395330-3	Blue
	Gold	395223-1	
11"	Nickel	395330-4	Green
	Gold	395223-4	
13"	Nickel	395330-5	Yellow
	Gold	395223-5	
15"	Nickel	395330-6	Orange
	Gold	395223-6	
19"	Nickel	395330-7	Black
	Gold	395223-7	
27"	Nickel	395330-8	Black
	Gold	395223-8	
35"	Nickel	395330-9	Red
	Gold	395223-9	
Fully Molded Shunt	Nickel	395481-1	Black
	Gold	395481-2	
Loop Type Shunt	Nickel	397298-2	Red
	Gold	397298-1	

## DUAL CONDUCTOR PATCHCORDS

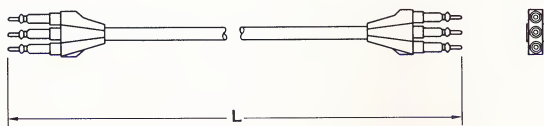
LENGTH (L)	TIP FINISH	PVC INSULATED CATALOG NO.	INSULATION COLOR
5"	Gold	495753-1	Red
7"	Gold	495753-2	Grey
9"	Gold	495753-3	Blue
11"	Gold	495753-4	Green
13"	Gold	495753-5	Yellow
15"	Gold	495753-6	Orange
19"	Gold	495753-7	Black
27"	Gold	495753-8	Black
35"	Gold	495753-9	Red



## PATCHCORDS (1/4") SINGLE CONDUCTOR—COAXIAL

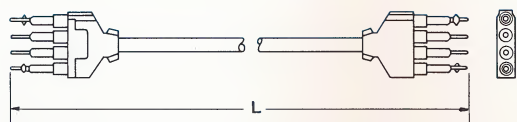
LENGTH (L)	TIP FINISH	PVC INSULATED CATALOG NO.	INSULATION COLOR
6"	Gold	395575-1	Brown
9"	Gold	395575-6	Red
12"	Gold	395575-2	Orange
15"	Gold	395575-7	Yellow
18"	Gold	395575-3	Green
21"	Gold	395575-8	Blue
24"	Gold	395575-4	Violet
36"	Gold	395575-5	Grey
45"	Gold	395575-9	White





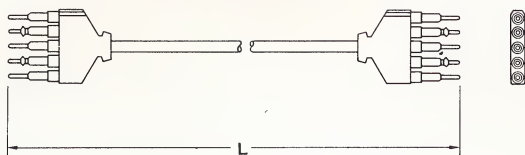
### TWO CONDUCTOR PLUS SHIELD PATCHCORDS

LENGTH (L)	TIP FINISH	PVC INSULATED CATALOG NO.	INSULATION COLOR
7"	Gold	497598-1	Black
9"	Gold	497598-2	Black
11"	Gold	497598-3	Black
13"	Gold	497598-4	Black
15"	Gold	497598-5	Black
19"	Gold	497598-6	Black
27"	Gold	497598-7	Black
24"	Gold	497598-8	Black
45"	Gold	497598-9	Black



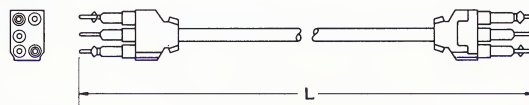
### THREE CONDUCTOR PLUS SHIELD PATCHCORDS (NON-POLARIZED)

LENGTH (L)	TIP FINISH	PVC INSULATED CATALOG NO.	INSULATION COLOR
7"	Gold	495547-1	Black
9"	Gold	495547-2	Black
11"	Gold	495547-3	Black
13"	Gold	495547-4	Black
15"	Gold	495547-5	Black
19"	Gold	495547-6	Black
24"	Gold	495547-8	Black
27"	Gold	495547-7	Black
40"	Gold	495547-9	Black



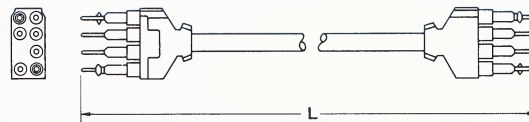
### FOUR CONDUCTOR PLUS SHIELD PATCHCORDS

LENGTH (L)	TIP FINISH	PVC INSULATED CATALOG NO.	INSULATION COLOR
7"	Gold	397751-1	Black
9"	Gold	397751-2	Black
11"	Gold	397751-3	Black
13"	Gold	397751-4	Black
15"	Gold	397751-5	Black
19"	Gold	397751-6	Black
24"	Gold	397751-7	Black
27"	Gold	397751-8	Black
45"	Gold	397751-9	Black



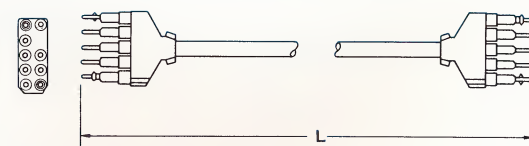
### FOUR CONDUCTOR PLUS SHIELD PATCHCORDS (DOMINO TYPE)

LENGTH (L)	TIP FINISH	PVC INSULATED CATALOG NO.	INSULATION COLOR
9"	Gold	495732-4	Black
13"	Gold	495732-5	Black
15"	Gold	495732-6	Black
19"	Gold	495732-1	Black
27"	Gold	495732-7	Black
36"	Gold	495732-8	Black
40"	Gold	495732-2	Black
45"	Gold	495732-9	Black
70"	Gold	495732-3	Black



### SIX CONDUCTOR PLUS SHIELD PATCHCORDS (DOMINO TYPE)

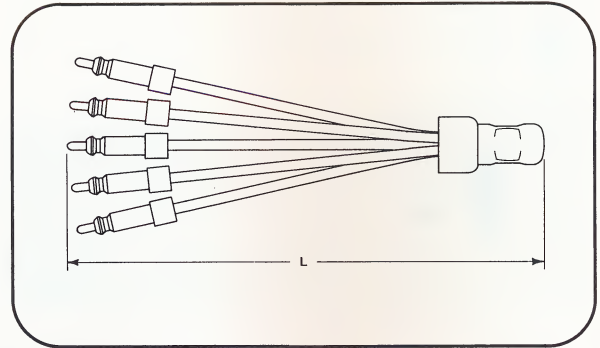
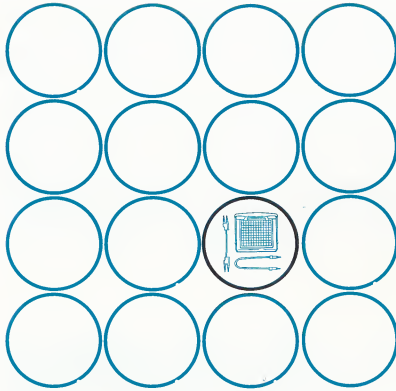
LENGTH (L)	TIP FINISH	PVC INSULATED CATALOG NO.	INSULATION COLOR
9"	Gold	495733-4	Black
13"	Gold	495733-5	Black
15"	Gold	495733-6	Black
19"	Gold	495733-1	Black
27"	Gold	495733-7	Black
36"	Gold	495733-8	Black
40"	Gold	495733-2	Black
45"	Gold	495733-9	Black
70"	Gold	495733-3	Black



### EIGHT CONDUCTOR PLUS SHIELD (DOMINO TYPE)

LENGTH (L)	TIP FINISH	PVC INSULATED CATALOG NO.	INSULATION COLOR
12"	Gold	397679-1	Black
18"	Gold	397679-2	Black
24"	Gold	397679-3	Black
36"	Gold	397679-4	Black
48"	Gold	397679-5	Black





### SQUID PATCHCORDS—(PVC INSULATED)

LENGTH (L)	TIP FINISH	CATALOG NUMBER								INSULATION COLOR
		3 PIN COMMON	4 PIN COMMON	5 PIN COMMON	6 PIN COMMON	7 PIN COMMON	8 PIN COMMON	9 PIN COMMON	10 PIN COMMON	
3"	Gold	495296-1	495297-1	495298-1	495299-1	495300-4	495301-4	495302-5	495303-4	Orange
5"	Gold	495296-6	495297-3	495298-3	495299-3	495300-5	495301-5	495302-4	495303-5	Red
7"	Gold	495296-5	495297-4	495298-4	495299-5	495300-1	495301-1	495302-1	495303-1	Grey
9"	Gold	495296-3	495297-2	495298-5	495299-4	495300-2	495301-2	495302-2	495303-2	Blue
11"	Gold	495296-2	495297-5	495298-2	495299-6	495300-3	495301-3	495302-3	495303-3	Green

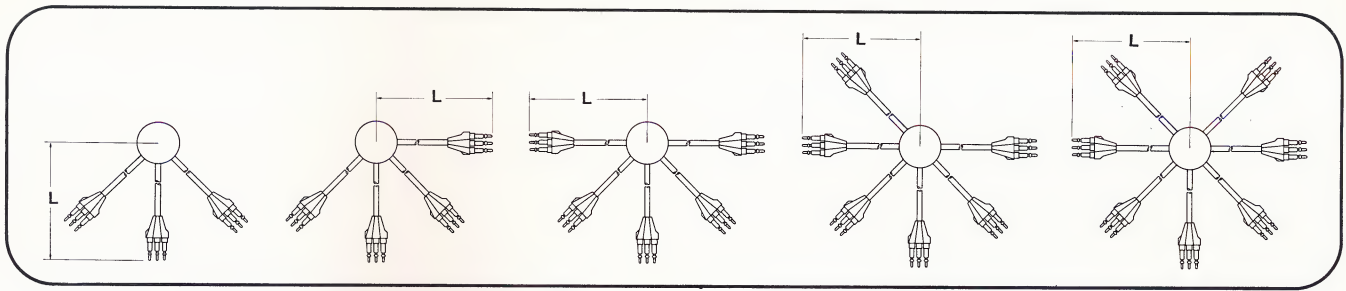
**SINGLE CONDUCTOR PLUS SHIELD—3 LEGS**

LENGTH (L)	TIP FINISH	CATALOG NO.	INSULATION COLOR
11"	Gold	695786-1	Orange
16"	Gold	695786-2	Yellow

**TWO CONDUCTOR PLUS SHIELD—3 LEGS**

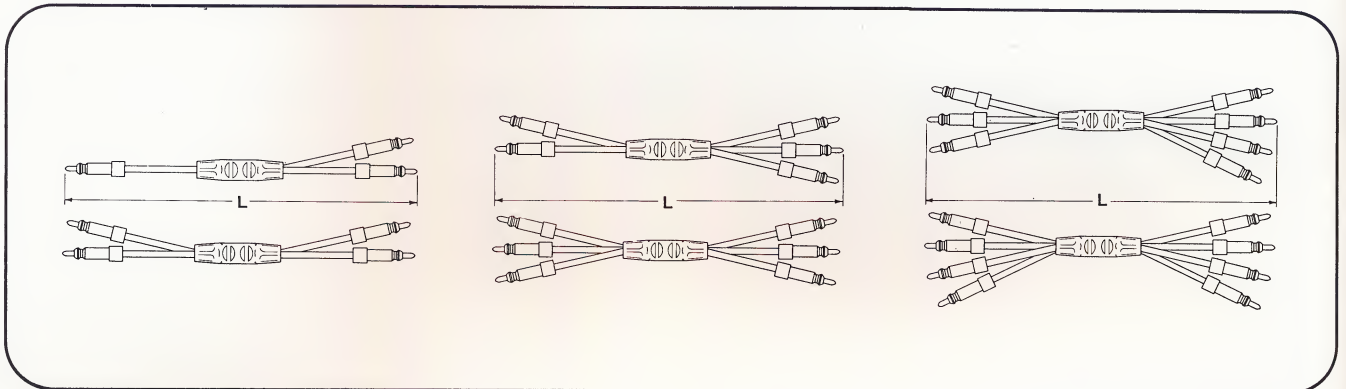
LENGTH (L)	TIP FINISH	CATALOG NO.	INSULATION COLOR
7"	Gold	695793-1	Black
9"	Gold	695793-2	Black
11"	Gold	695793-3	Black
13"	Gold	695793-4	Black
16"	Gold	695793-5	Black
19"	Gold	695793-6	Black
27"	Gold	695793-7	Black
24"	Gold	695793-8	Black
45"	Gold	695793-9	Black





### BALL SQUID TWO CONDUCTOR AND SHIELDED

LENGTH (L)	TIP FINISH	3 LEGS	4 LEGS	5 LEGS	6 LEGS	7 LEGS	COLOR OF BALL
16"	Gold	497487-1	497488-1	497489-1	497490-1	497491-1	Orange
16"	Gold	497487-2	497488-2	497489-2	497490-2	497491-2	Yellow
16"	Gold	497487-3	497488-3	497489-3	497490-3	497491-3	Blue
16"	Gold	497487-4	497488-4	497489-4	497490-4	497491-4	Green
16"	Gold	497487-5	497488-5	497489-5	497490-5	497491-5	Red
27"	Gold	497487-6	497488-6	497489-6	497490-6	497491-6	Blue



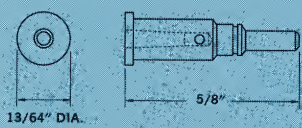
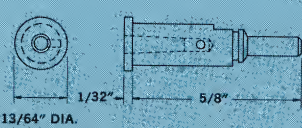

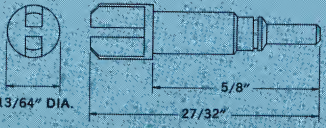

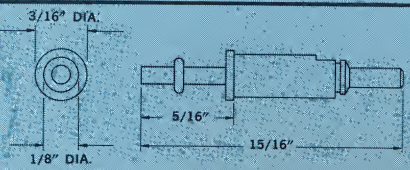
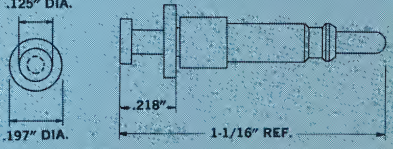
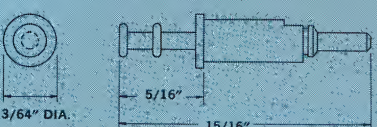
### "Y" PATCHCORDS—(PVC INSULATED)

LENGTH (L)	TIP FINISH	CATALOG NUMBER						INSULATION COLOR
		3 PIN COMMON	4 PIN COMMON	5 PIN COMMON	6 PIN COMMON	7 PIN COMMON	8 PIN COMMON	
7"	Nickel	495390-1	495391-1	495392-1	495393-1	495394-1	495395-1	Grey
7"	Gold	495396-1	495397-1	495398-1	495399-1	495400-1	495401-1	Grey
9"	Nickel	495390-2	495391-2	495392-2	495393-2	495394-2	495395-2	Blue
9"	Gold	495396-2	495397-2	495398-2	495399-2	495400-2	495401-2	Blue
11"	Nickel	495390-3	495391-3	495392-3	495393-3	495394-3	495395-3	Green
11"	Gold	495396-3	495397-3	495398-3	495399-3	495400-3	495401-3	Green
13"	Nickel	495390-4	495391-4	495392-4	495393-4	495394-4	495395-4	Yellow
13"	Gold	495396-4	495397-4	495398-4	495399-4	495400-4	495401-4	Yellow
15"	Nickel	495390-5	495391-5	495392-5	495393-5	495394-5	495395-5	Orange
15"	Gold	495396-5	495397-5	495398-5	495399-5	495400-5	495401-5	Orange
19"	Nickel	495390-6	495391-6	495392-6	495393-6	495394-6	495395-6	Black
19"	Gold	495396-6	495397-6	495398-6	495399-6	495400-6	495401-6	Black
27"	Nickel	495390-7	495391-7	495392-7	495393-7	495394-7	495395-7	Black
27"	Gold	495396-7	495397-7	495398-7	495399-7	495400-7	495401-7	Black

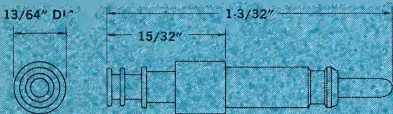
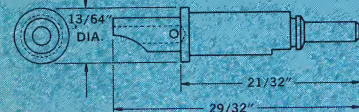
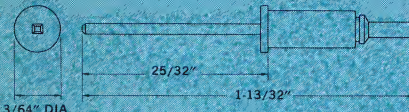
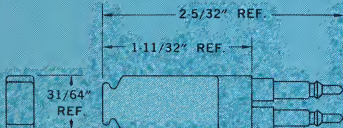
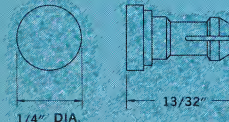
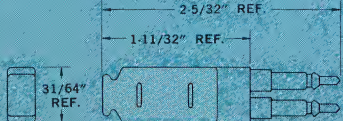
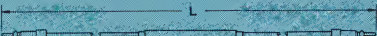
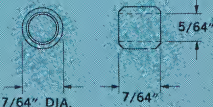
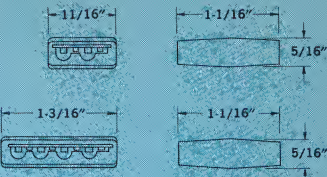
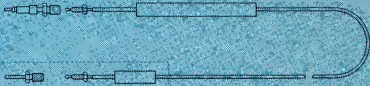


# Accessories

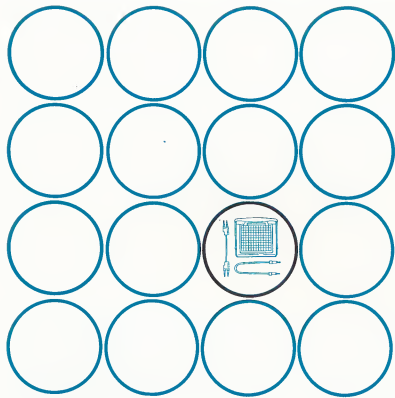
FOR NYLON SLEEVE  
PATCHCORDS

		CATALOG NO.	FINISH
<b>UNINSULATED TAPER PIN ADAPTER</b> ("C" Washer Retention) Accepts Series 53 Taper Pins		395511-1	Nickel Plated
		395511-2	Gold Plated
<b>UNINSULATED TAPER PIN ADAPTER</b> (Non-Rotating "C" Washer Retention) Accepts Series 53 Taper Pin		395552-1	Nickel Plated
		395552-2	Gold Plated
<b>INSULATED TAPER PIN ADAPTER</b> Accepts Series 53 Taper Pin (Can be post-patched)		395187-1	Nickel Plated
		395187-2	Gold Plated
<b>UNINSULATED EDGE CONNECTOR ADAPTER</b> ("C" Washer Retention) For Soldered Connections Where Wrapping the Conductor is Impractical		395516-1	Nickel Plated
		395516-2	Gold Plated
<b>INSULATED EDGE CONNECTOR ADAPTER</b> For Soldered Connections Where Wrapping the Conductor is Impractical (Can be post-patched)		395647-1	Nickel Plated
		395647-2	Gold Plated
<b>UNINSULATED TURRET LUG ADAPTER, SINGLE TURRET</b> (Non-Rotating "C" Washer Retention) For Soldered Connections		395938-1	Nickel Plated
		395938-2	Gold Plated
<b>INSULATED TURRET LUG ADAPTER, SINGLE TURRET</b> (Can be post-patched) For Soldered Connections		421111-1	Nickel Plated
		421111-2	Gold Plated
<b>UNINSULATED TURRET LUG ADAPTER, DOUBLE TURRET</b> (Non-Rotating "C" Washer Retention) For Soldered Connections		395645-2	Gold Plated



		CATALOG NO.	FINISH	
<b>INSULATED TAPER PIN TURRET LUG ADAPTER</b> (Can be post-patched) For Soldered Connections or Series 53 Taper Pin, or Combination of Both		495839-1	Nickel Plated	
		495839-2	Gold Plated	
<b>UNINSULATED SOLDER TUBE ADAPTER</b> (Non-Rotating "C" Washer Retention) For Soldered Connection with Larger Conductors		395809-1	Nickel Plated	
		395809-2	Gold Plated	
<b>WRAP-TYPE POST ADAPTER</b> (Non-Rotating "C" Washer Retention) For wrap-type connections.		397550-1	Nickel Plated	
		397550-2	Gold Plated	
<b>RESISTOR PLUG</b>		595680	Gold Plated	
<b>MARKER PLUG</b> For temporary marking of patch- cord hole, aluminum marker plug is inserted in contact hole in front board assembly.		395348-1	White Top	
<b>DIODE PLUG</b> Anode—White Sleeve Cathode—Red Sleeve Nylon Sleeves		595857-1	Gold Plated	
<b>PATCHCORD WITH DIODE</b>		420403	Nickel Plated	
<b>BUSHING FOR PERMANENT PATCHING</b>		CATALOG NO.	MATERIAL	
		395149-1	Red Nylon	
<b>COMMONING BLOCK</b> For Electrical Commoning of Two or More Patchtips		NO. OF HOLES	CATALOG NO.	FINISH
		4	495894-1	Gold Plated
			495894-2	Nickel Plated
		8	495895-1	Gold Plated
			495895-2	Nickel Plated
<b>TEST PROBE ASSEMBLY</b>  End Within Dotted Line Omitted on Dash 2 & 3		CATALOG NO.	LENGTH	COLOR
		397029-1	72"	Black
		397029-2	48"	Black
		397029-3	48"	Red
		397029-4	48"	Black
		397029-5	48"	Red

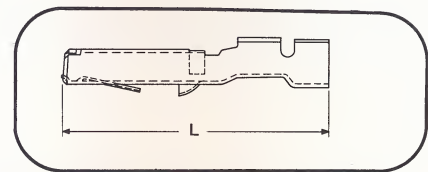




# Installation wiring

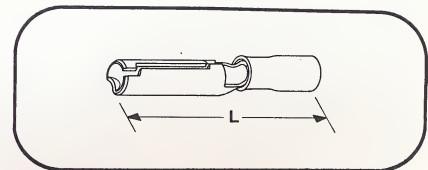
**IMPORTANT** — The selection of rear board wiring (either LANCELOK terminals or taper pin terminals) must coincide with the selection of the rear boards. LANCELOK terminals will not mate with rear boards that accept taper pin terminals and vice versa. The correct part number is assurance against mis-mating.

## Lancelok Terminals



### UNINSULATED — FORMED

WIRE SIZE	CATALOG NUMBER	INSULATION DIA. RANGE	OVERALL LENGTH (L)	FINISH	HAND TOOL	AMP-TAPEMATIC * TOOLS 69359-2 69370 and 69332	INSERTION TOOL	EXTRACTION TOOL
						DIE NUMBER		
24-20	2-328969-1	.065-.080	.781	Gold	69323	69416	69421	69261-1
	2-328969-2	.065-.080	.781	Tin	69323	69416	69421	69261-1
	330371	.040-.065	.781	Gold	69323	69415	69421	69261-1
18-16	329321	.100-.130	.812	Gold	69323	69418	69421	69261-1
	2-329321-1	.100-.130	.812	Tin	69323	69418	69421	69261-1
	330370	.075-.100	.812	Gold	69323	69417	69421	69261-1

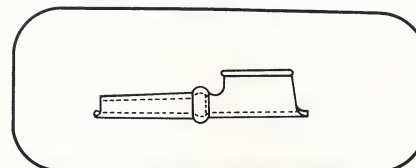


### PRE-INSULATED — FORMED

WIRE SIZE	CATALOG NUMBER	INSULATION DIA. RANGE	OVERALL LENGTH (L)	FINISH	HAND TOOL	AMP-TAPEMATIC TOOLS 69118, 69290, 69359-2 69370 & 69332	INSERTION TOOL	EXTRACTION TOOL
						DIE NUMBER		
24-22	329317	.040-.080	.875	Gold	69256	69345	69421	69261-1
	2-329317-1	.040-.080	.875	Tin	69256	69345	69421	69261-1
20-18	329334	.060-.090	.875	Gold	69257	69346	69421	69261-1
	2-329334-1	.060-.090	.875	Tin	69257	69346	69421	69261-1
16	329335	.080-.110	.937	Gold	69258	69347	69421	69261-1
	2-329335-1	.080-.110	.937	Tin	69258	69347	69421	69261-1

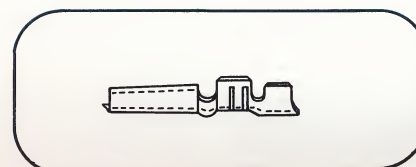


# Taper Pins



## NON-INSULATION SUPPORT — FORMED PINS

PIN INFORMATION					TOOLING INFORMATION				
WIRE SIZE	CATALOG NUMBER	INSULATION DIA. RANGE	OVERALL LENGTH	FINISH(a)	DOUBLE ACTION HAND TOOL	STRAIGHT ACTION HAND TOOL	69365 TOOL DIE NUMBER	69319-1 TOOL DIE NUMBER	PULL† TEST INSERTION TOOL
20-16	41653		.562	Tin <sup>1</sup>	47093		690047	690047	497652-2
	41654		.562	Silver <sup>2</sup>	47093		690047	690047	497652-2
	41655		.562	Gold <sup>3</sup>	47093		690047	690047	497652-2
	41992		.562	Brass	47093				497652-2
	42682-1		.562	Rhodium <sup>8</sup>	47093				497652-2
	42682-2		.562	Gold <sup>4</sup>	47093				497652-2



## INSULATION SUPPORT — FORMED PINS

PIN INFORMATION					TOOLING INFORMATION				
WIRE SIZE	CATALOG NUMBER	INSULATION DIA. RANGE	OVERALL LENGTH	FINISH(a)	DOUBLE ACTION HAND TOOL	STRAIGHT ACTION HAND TOOL	69365 TOOL DIE NUMBER	69319-1 TOOL DIE NUMBER	PULL† TEST INSERTION TOOL
24-22	41278	.040-.060	.540	Tin <sup>1</sup>	48698	90000	673514	673514	497652-1
	41496	.040-.060	.540	Brass	48698	90000	673514	673514	497652-1
	41640	.040-.060	.540	Silver <sup>2</sup>	48698	90000	673514	673514	497652-1
	41646	.040-.060	.540	Gold <sup>3</sup>	48698	90000	673514	673514	497652-1
	41862	.040-.060	.540	Gold <sup>4</sup>	48698	90000	673514	673514	497652-1
	42600-1	.040-.060	.540	Gold <sup>5</sup>	48698	90000	673514	673514	497652-1
	42600-2	.040-.060	.540	Gold <sup>5</sup>	48698	90000	673514	673514	497652-1
	66091-1	.040-.060	.540	Brass					497652-1
	66091-2	.040-.060	.540	Tin <sup>1</sup>					497652-1
	66091-3	.040-.060	.540	Gold <sup>3</sup>					497652-1
	66091-4	.040-.060	.540	Pre-Plate Tin Lead .0001 Thk.					497652-1
	66113-1	.040-.060	.590	Gold <sup>3</sup>	48698	90000			497652-1
	66113-2	.040-.060	.590	Silver <sup>2</sup>	48698	90000			497652-1
	66113-3	.040-.060	.590	Tin <sup>1</sup>	48698	90000			497652-1
	66113-4	.040-.060	.590	Pre-Plate Tin Lead .0001 Thk.	48698	90000			497652-1
	41222	.065-.080	.600	Brass	47042				497652-2
	66033-1	.065-.080	.600	Gold <sup>5</sup>	47042				497652-2
	41647	.065-.080	.600	Tin <sup>1</sup>	47042		673515	673515	497652-2
	41648	.065-.080	.600	Silver <sup>2</sup>	47042		673515	673515	497652-2
	41649	.065-.080	.600	Gold <sup>3</sup>	47042		673515	673515	497652-2
	41863	.065-.080	.600	Gold <sup>4</sup>	47042		673515	673515	497652-2

(a) Finish Code: — <sup>1</sup>.0002 Tin, <sup>2</sup>.0002 Silver, <sup>3</sup>.00003 Gold over .00005 Nickel, <sup>4</sup>.0001 Gold over .0001 Silver, <sup>5</sup>.0002 Gold over .00005 Nickel, <sup>6</sup>.00005 Gold over .00005 Nickel, <sup>7</sup>.0001 Gold over .0001 Nickel, <sup>8</sup>.00001 Rhodium over .0002 Silver, <sup>9</sup>.000075 Gold over .0001 Copper.

†Extension for Pull Test Insertion Tool—Part No. 397989-1. Extraction Tool No. 380305-1.



# INSULATION SUPPORT — FORMED PINS (Continued)

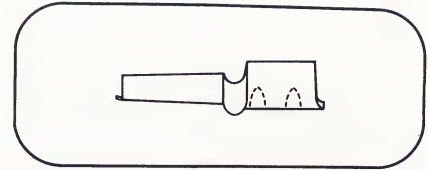
PIN INFORMATION					TOOLING INFORMATION				
WIRE SIZE	CATALOG NUMBER	INSULATION DIA. RANGE	OVERALL LENGTH	FINISH(a)	DOUBLE ACTION HAND TOOL*	STRAIGHT ACTION HAND TOOL	69365 TOOL DIE NUMBER	69319-1 TOOL DIE NUMBER	PULL† TEST INSERTION TOOL
20-18	42229-1	.060-.080	.667	Tin <sup>1</sup>	47566		673528	673528	497652-2
	42229-2	.060-.080	.667	Silver <sup>2</sup>	47566		673528	673528	497652-2
	42229-3	.060.080	.667	Gold <sup>3</sup>	47566		673528	673528	497652-2
	42229-4	.060.080	.667	Brass	47566		673528	673528	497652-2
	42229-5	.060.080	.667	Gold <sup>4</sup>	47566		673528	673528	497652-2
	42229-6	.060.080	.667	Gold <sup>5</sup>	47566		673528	673528	497652-2
	42229-7	.060.080	.667	Gold <sup>6</sup>	47566		673528	673528	497652-2
	66200-1	.060.080	.667	Tin <sup>1</sup>					497652-2
	41650	.080-.100	.667	Tin <sup>1</sup>	47043-LH 90010-SH		673507	673507	497652-2
	41651	.080-.100	.667	Silver <sup>2</sup>	47043-LH 90010-SH		673507	673507	497652-2
	41652	.080-.100	.667	Gold <sup>3</sup>	47043-LH 90010-SH		673507	673507	497652-2
	41864	.080-.100	.667	Gold <sup>4</sup>	47043-LH 90010-SH		673507	673507	497652-2
	41991	.080-.100	.667	Brass	47043-LH 90010-SH				497652-2
	42773-1	.080-.100	.667	Tin <sup>1</sup>	47043-LH 90010-SH				497652-2
	42773-2	.080-.100	.667	Silver <sup>2</sup>	47043-LH 90010-SH				497652-2
	42773-3	.080-.100	.667	Gold <sup>3</sup>	47043-LH 90010-SH				497652-2
	42773-4	.080-.100	.667	Brass	47043-LH 90010-SH				497652-2
	60183-1	.080-.100	.667	Gold <sup>5</sup>	47043-LH 90010-SH				497652-2
18-16	60066-1	.070-.100	.667	Tin <sup>1</sup>	45456				497652-2
	60066-2	.070-.100	.667	Silver <sup>2</sup>	45456				497652-2
	60066-3	.070-.100	.667	Gold <sup>3</sup>	45456				497652-2
	60066-4	.070-.100	.667	Gold <sup>4</sup>	45456				497652-2
	60066-5	.070-.100	.667	Brass	45456				497652-2
	41223	.100-.140	.667	Brass	90024-LH 47044-SH	90007			497652-2
	41656	.100-.140	.667	Tin <sup>1</sup>	90024-LH 47044-SH	90007	673516	673516	497652-2
	41657	.100-.140	.667	Silver <sup>2</sup>	90024-LH 47044-SH	90007	673516	673516	497652-2
	41658	.100-.140	.667	Gold <sup>3</sup>	90024-LH 47044-SH	90007	673516	673516	497652-2
	42774-1	.100-.140	.667	Tin <sup>1</sup>	90024-LH 47044-SH				497652-2
	42774-2	.100-.140	.667	Silver <sup>2</sup>	90024-LH 47044-SH				497652-2
	42774-3	.100-.140	.667	Gold <sup>3</sup>	90024-LH 47044-SH				497652-2
	42774-4	.100-.140	.667	Brass	90024-LH 47044-SH				497652-2
	60184-1	.100-.140	.667	Gold <sup>5</sup>	90024-LH 47044-SH	90007			497652-2
	41865	.100-.140	.667	Gold <sup>4</sup>	90024-LH 47044-SH	90007			497652-2
66202-1	.100-.140	.667	Tin <sup>1</sup>		90007			497652-2	
#30 Copper Weld	42762-1	.040-.060	.530	Tin <sup>1</sup>	46459				497652-1
	42762-2	.040-.060	.530	Silver <sup>2</sup>	46459				497652-1
	42762-3	.040-.060	.530	Gold <sup>3</sup>	46459				497652-1
	42762-4	.040-.060	.530	Brass	46459				497652-1

\*LH = Long handle tool. SH = Short handle tool.

(a) Finish Code: — 1.0002 Tin, 2.0002 Silver, 3.00003 Gold over .00005 Nickel, 4.0001 Gold over .0001 Silver, 5.0002 Gold over .00005 Nickel, 6.00005 Gold over .00005 Nickel, 7.0001 Gold over .0001 Nickel, 8.00001 Rhodium over .0002 Silver, 9.000075 Gold over .0001 Copper.

†Extension for Pull Test Insertion Tool—Part No. 397989-1. Extraction Tool No. 380305-1.

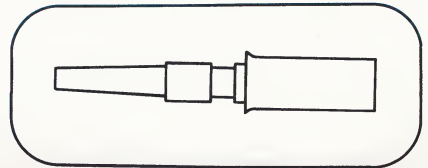




# INSULATION PIERCING — FORMED PINS

PIN INFORMATION					TOOLING INFORMATION				
WIRE SIZE	CATALOG NUMBER	INSULATION DIA. RANGE	OVERALL LENGTH	FINISH(a)	DOUBLE ACTION HAND TOOL	STRAIGHT ACTION HAND TOOL	69365 TOOL DIE NUMBER	69319-1 TOOL DIE NUMBER	PULL ** TEST INSERTION TOOL
24-22	41224	.055-.060	.520	Brass	47106† 47150				497652-1
	41279	.055-.060	.520	Tin <sup>1</sup>	47106† 47150				497652-1
	41641	.055-.060	.520	Silver <sup>2</sup>	47106† 47150				497652-1
	41744	.055-.060	.520	Gold <sup>3</sup>	47106† 47150				497652-1

†This tool does not have Certi-Crimp\* ratchet.



# PRE-INSULATED — SOLID LONG SHOULDER PINS

PIN INFORMATION					TOOLING INFORMATION				
WIRE SIZE	CATALOG NUMBER	INSULATION DIA. RANGE	NYLON INSULATION COLOR CODE	OVERALL LENGTH	FINISH(a)	DOUBLE ACTION HAND TOOL*	69118-1 AMP-TAPEMATIC TOOL DIE NUMBER	69365 AND 69319-1 TOOL DIE NUMBER	PULL ** TEST INSERTION TOOL
26	66059-1	.040-.080	Blue	.830	Tin <sup>1</sup>	46222-SH 90015-LH	45306	690010	497652-3
	66059-2	.040-.080	Blue	.830	Silver <sup>2</sup>	46222-SH 90015-LH	45306	690010	497652-3
	66059-3	.040-.080	Blue	.830	Gold <sup>3</sup>	46222-SH 90015-LH	45306	690010	497652-3
	66129-1	.080-.115	Black	.850	Tin <sup>1</sup>	46223-SH 90016-LH	45305	690011	497652-3
	66129-2	.080-.115	Black	.850	Silver <sup>2</sup>	46223-SH 90016-LH	45305	690011	497652-3
	66129-3	.080-.115	Black	.850	Gold <sup>3</sup>	46223-SH 90016-LH	45305	690011	497652-3
24-22	42633-1	.040-.080	Yellow	.830	Tin <sup>1</sup>	46222-SH 90015-LH	45306	690010	497652-3
	42633-2	.040-.080	Yellow	.830	Silver <sup>2</sup>	46222-SH 90015-LH	45306	690010	497652-3
	42633-3	.040-.080	Yellow	.830	Gold <sup>3</sup>	46222-SH 90015-LH	45306	690010	497652-3
	66070	.080-.115	Black	.850	Gold <sup>3</sup>	46223-SH 90016-LH	45305	690011	497652-3
20-18	42634-1	.060-.100	Natural	.850	Tin <sup>1</sup>	46223-SH 90016-LH	45305	690011	497652-3
	42634-2	.060-.100	Natural	.850	Silver <sup>2</sup>	46223-SH 90016-LH	45305	690011	497652-3
	42634-3	.060-.100	Natural	.850	Gold <sup>3</sup>	46223-SH 90016-LH	45305	690011	497652-3
16	42646-1	.080-.115	Black	.850	Tin <sup>1</sup>	46223-SH 90016-LH	45305	690011	497652-3
	42646-2	.080-.115	Black	.850	Silver <sup>2</sup>	46223-SH 90016-LH	45305	690011	497652-3
	42646-3	.080-.115	Black	.850	Gold <sup>3</sup>	46223-SH 90016-LH	45305	690011	497652-3

\*LH = Long handle tool. SH = Short handle tool.

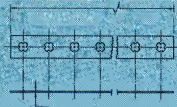
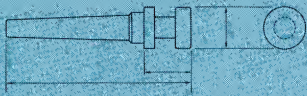
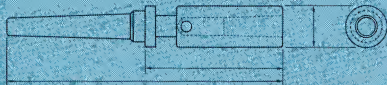
(a) Finish Code: —<sup>1</sup>.0002 Tin, <sup>2</sup>.0002 Silver, <sup>3</sup>.00003 Gold over .00005 Nickel, <sup>4</sup>.0001 Gold over .0001 Silver, <sup>5</sup>.0002 Gold over .00005 Nickel, <sup>6</sup>.00005 Gold over .00005 Nickel, <sup>7</sup>.0001 Gold over .0001 Nickel, <sup>8</sup>.00001 Rhodium over .0002 Silver, <sup>9</sup>.000075 Gold over .0001 Copper.

\*\*Extension for Pull Test Insertion Tool—Part No. 397989-1. Extraction Tool No. 380305-1.



# Accessories

## FOR TAPER PINS

COMMONING STRIPS For Electrical Commoning of Contact Springs (Use with 397589 Below)		NO. OF CONTACTS	CATALOG NO.	FINISH
		To Be Specified By Customer	397576-1	Gold Plated
			397576-3	Tin Plated
COMMONING PIN (For Use with 397576 Above) No Receptacle		CATALOG NO.		FINISH
		397589-3		Gold Plated
COMMONING PIN (For Use with 397576 Above) With Series "53" Taper Receptacle		397589-5		Nickel Plated
		397589-2		Gold Plated

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41496	38	42229-7	39	60066-5	39	2-329335-1	37
41640	38	42600-1	38	60183-1	39	330370	37
41641	40	42600-2	38	60184-1	39	330371	37
41646	38	42633-1	40	66033-1	38	395056-1	18
41647	38	42633-2	40	66059-1	40	395056-2	18
41648	38	42633-3	40	66059-2	40	395149-1	36
41649	38	42634-1	40	66059-3	40	395187-1	35
41650	39	42634-2	40	66070	40	395187-2	35
41651	39	42634-3	40	66091-1	38	395223-1	31
41652	39	42646-1	40	66091-2	38	395223-2	31
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41744	40	42762-3	39	66129-1	40	395223-9	31
41862	38	42762-4	39	66129-2	40	395330-1	31
41863	38	42773-1	39	66129-3	40	395330-2	31
41864	39	42773-2	39	66200-1	39	395330-3	31
41865	39	42773-3	39	66202-1	39	395330-4	31
41991	39	42773-4	39	2-328969-1	37	395330-5	31
41992	38	42774-1	39	2-328969-2	37	395330-6	31
42224	40	42774-2	39	329317	37	395330-7	31
42229-1	39	42774-3	39	2-329317-1	37	395330-8	31
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# Numerical Index

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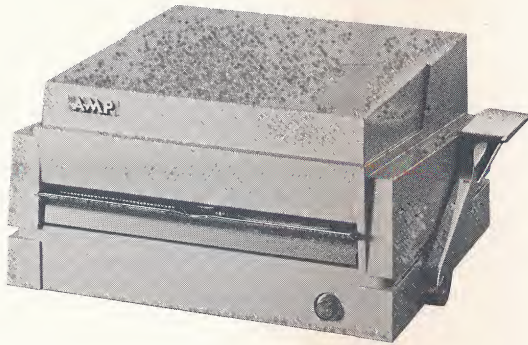


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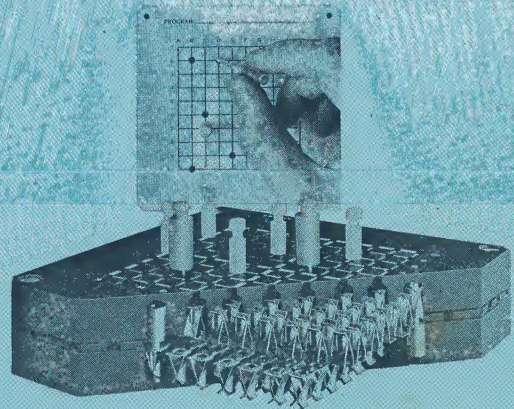


# Other A-MP Programming Products



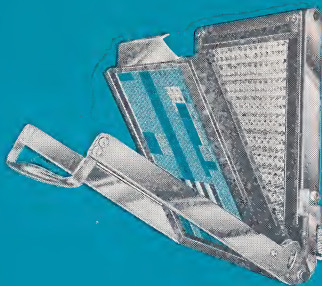
## CARD PROGRAMMING SYSTEM

This compact, accurate and easy-to-use card programming system accepts all standard-size tab cards and instantly translates punched information into electrical impulses for data or switching controls. The A-MP Card Programming System permits individual sorting and rapid verifying of punched cards and the extraction of data from bent and mutilated cards. It handles an unlimited number of control programs by manual substitution of one card for another. This system is ideally suited to innumerable programs for which high-speed card programmers are not needed nor justifiable from the standpoint of cost and adaptability. The A-MP Card Programming System is available in a desk top model (as illustrated) or in a rack-mounted model for use in cabinets or enclosures.



## PINBOARD PROGRAMMING SYSTEM

This simplified programming device reduces complex switching operations to the insertion of pins in specified locations on the board. Pre-programming is accomplished through the use of templates with pre-punched holes that correspond with programming requirements. In this way, hundreds of intricate switching combinations may be prepared in advance and filed for instantaneous recall and error-free change. With A-MP Pinboards re-programming time is held to a minimum. Pin insertion is faster than by reference to program identification on a pinboard assembly or supplemental program log. The template hole pattern can be punched with a pencil tip or other sharp object. Programming pins—shorting, diode or other component-carrying types—will not bend or buckle regardless of repeated insertions and extractions.



## SHIELDED PROGRAMMING SYSTEMS

A-MP Shielded Systems and Panels are designed for critical low-level circuit applications. They constitute the only existing equipment with complete insulation for individual circuits. This insulation significantly reduces crosstalk between circuits, and shields against external interference.

Both the programming patchcords and rear boards contain individual nylon cells spaced  $\frac{3}{8}$ " on centers fully surrounded by interlocking metal bars. The edges of the nylon cells cover the bars without touching each other. This construction provides an effective ground barrier around each patchcord plug and contact spring.

At 50,000 cycles, the AC resistance of the nylon cells is 20,000 to 30,000 ohms—high enough to have little or no effect on circuits of 5,000 ohms impedance or less. Leakage resistance of cells to ground is  $10^{12}$  ohms or greater.



# AMP INCORPORATED

## Syscom Division

### Harrisburg, Pennsylvania